

THE
SURGICAL CLINICS
OF
CHICAGO

APRIL, 1919

VOLUME 3—NUMBER 2
WITH 63 ILLUSTRATIONS

PHILADELPHIA AND LONDON
W. B. SAUNDERS COMPANY .

COPYRIGHT 1919 BY W. B. SAUNDERS COMPANY. ALL RIGHTS RESERVED.
PUBLISHED SIX MONTHLY (SIX NUMBERS A YEAR) BY W. B. SAUNDERS COMPANY, WEST WASHINGTON
SQUARE, PHILADELPHIA.
PRINTED IN AMERICA.

CONTRIBUTORS TO THIS NUMBER

- E. WYLLYS ANDREWS, M. D.,** Professor of Surgery Northwestern University Medical School, Chief of Staff Mercy Hospital Chicago Surgeon in Chief Cook County Hospital Chicago Attending Surgeon Michael Reese Hospital Chicago
- CARL BECK, M. D.** Surgeon North Chicago Hospital
- ARTHUR DEAN BEVAN, M. D.** Professor of Surgery at Rush Medical College in Affiliation with the University of Chicago Surgeon to the Presbyterian Hospital Chicago
- TRUMAN W. BROPHY, M. D., D. D. S.** President and Professor of Oral Surgery Chicago College of Dental Surgery Oral Surgeon, St. Joseph's and Michael Reese Hospitals Chicago, etc. Consulting Oral Surgeon Presbyterian Hospital Chicago
- BENJAMIN FRANKLIN DAVIS, M. D.** Assistant Attending Surgeon Presbyterian Hospital Chicago Instructor in Surgery Rush Medical College Chicago
- CARL BRADEN DAVIS, M. D.** Presbyterian Hospital Chicago
- DANIEL N. EISENDRATH, M. D.** Clinical Professor of Surgery Rush Medical College Chicago Attending Surgeon Michael Reese and Cook County Hospitals, Chicago
- DR. GATEWOOD** Instructor in Surgery Rush Medical College Chicago
- ROBERT H. HERBST, M. D.** Assistant Professor of Genito-Urinary Surgery Rush Medical College Chicago
- WILLIAM HESSERT, M. D.** Professor of Surgery Chicago Polyclinic Surgeon to Alexian Brothers Hospital St. Joseph's Hospital Henrietta Memorial Hospital Chicago Polyclinic Hospital and Uhlich Orphan Asylum Chicago
- FRANKLIN BENNETT McCARTY, M. D.** Instructor in Surgery Rush Medical College Chicago
- GOLDER LEWIS McWHORTER, M. D.** Instructor in Surgery Rush Medical College Chicago
- EDWARD LOUIS MOORHEAD, M. D.** Surgeon to Mercy Hospital Chicago Adjunct Clinical Professor of Surgery Northwestern University Medical School
- ALBERT J. OCHSNER, M. D., LL.D.** Surgeon in Chief Augustana and St. Mary's Hospitals Chicago, Professor of Clinical Surgery in the Medical Department of the State University of Illinois
- EMMET A. PRINTY, M. D.** Director Laboratory of Surgical Technique Surgeon Provident Hospital Chicago Associate Surgeon South Shore Hospital Chicago Associate Surgeon Operative Surgery Department Northwestern University Medical School
- VICTOR L. SCHRAGER, M. D.** Assistant Professor of Surgery Rush Medical College, Chicago Attending Surgeon Frances Willard and Cook County Hospitals Chicago
- THOMAS J. WATKINS, M. D.** Professor of Gynecology Northwestern University Medical School Gynecologist St. Luke's Hospital Chicago

SURGICAL CLINICS OF CHICAGO

Volume 3

Number 2

CLINIC OF DR. E. WYLLIS ANDREWS

ST. LUKE'S HOSPITAL

CHOLECYSTECTOMY AND THE MANAGEMENT OF THE PROXIMAL STUMP OF THE CYSTIC DUCT

Summary Reasons for and against cholecystectomy—recurrence of symptoms following ectomy—technic which minimizes postoperative complications

IN this patient the conditions require a cholecystectomy or removal of the diseased gall bladder packed with stones rather than simple section and removal of the stones.

Inasmuch as the walls of this distended gall bladder are thickened and may contain the nuclei of future stones and as there are no contraindications we prefer the ectomy lest this organ should keep up a biliary fistula or again become septic and require operation.

We are now confronted with some of the obstacles and objections hitherto pertaining to cholecystectomy. In the first place removal of this organ does not give immunity from recurrence. Next it may be that in so removing it we deprive ourselves of a useful appendage should we later require drainage of the gall tracts either externally or by a cholecystenterostomy into the intestine. Secondary operations are often easier if the gall bladder has not been removed. But in spite of these objections our routine in this type of case is total extirpation of the gall bladder. One form of recurrence after ectomies is the surprising appearance of what seems like a new gall bladder. We know now that this is only the dilated proximal stump of the cystic duct which in the course of months or years may be dilated into a cystic cavity resembling the old gall bladder. The results of our work have been much better since we read

CONTENTS

CLINIC OF DR. E. WYLLYS ANDREWS, <i>St. Luke's Hospital</i>	PAGE
COLECTECTOMY AND THE MANAGEMENT OF THE PROXIMAL STUMP OF THE CYSTIC DOCT.	237
USE OF KANGAROO TENDON AND SPUN THREADS OF TENDON AS SUBSTITUTES FOR CATGUT	243
MULTIPLE DRILLING OF FRACTURES—AN OLD-FASHIONED OPERATION REVISED	243
CLINIC OF DR. TRUMAN W. BROPHY, <i>St. Joseph's Hospital</i>	
HARLEIGH	265
CLINIC OF DR. CARL BECK, <i>North Chicago Hospital</i>	
MULTIPLE PAPILLOMATA OF BLADDER	271
SYPHILIS OF THE STOMACH—RESECTION OF PELVICUS FOR IMPERMEABLE LUTING STRICTURE	273
RESTORATION OF CREEK FOLLOWING EXTENSIVE RESECTION FOR CARCINOMA	281
CLINIC OF DR. CARL B. DAVIS, <i>Presbyterian Hospital</i>	
PLASTIC REPAIR OF DELTOID MUSCLE	287
RECURRENT DISLOCATION OF THE PATELLA	291
CLINIC OF DR. THOMAS J. WATKINS, <i>St. Luke's Hospital</i>	
A PLASTIC OPERATION FOR CONSTRUCTION AT THE VAGINAL ORIFICE AND FOR VAGINITIS	295
CARCINOMA OF THE CERVIX TREATED BY RADIUM AND HYSTERECTOMY	299
CLINIC OF DR. ARTHUR DEAN BEVAN, <i>Presbyterian Hospital</i>	
....	301
..	331
..	333
..	339
..	349
..	353
..	363
CLINIC OF DR. FRANKLIN B. MCCARTY, <i>Rush Medical College</i>	
FRACTURE OF THE CARPAL SCAPHOID	371
CLINIC OF DR. VICTOR L. SCHRAGER, <i>Cook County Hospital</i>	
A SUGGESTION IN THE TECHNIQUE OF THE RADICAL OPERATION FOR CARCINOMA OF THE BREAST	385
ROUTINE APPENDICETOMY THROUGH RIGHT INDIRECT INGUINAL HERNIAL SAC IN ATERRILE CASES	387
SYPHILIS OF THE LIVER CONTAINING GALL-BLADDER PATHOLOGY	389
CLINIC OF DR. BENJAMIN F. DAVIS, <i>Presbyterian Hospital</i>	
WINGED SCAPULA—SERRATUS MAGNUS PALSY	391
CLINIC OF DR. WILLIAM HESSELT, <i>St. Joseph's Hospital</i>	
UNUNITED FRACTURE OF NECK OF FEMUR—TREATMENT BY BONE TRANSPLANTATION	399
CLINIC OF DR. G. L. McWHORTER, <i>Presbyterian Hospital</i>	
DIAGNOSIS OF FISTULA IN ANO	423
CLINIC OF DR. DANIEL N. EISENDRATH, <i>Cook County Hospital</i>	
FRACTURES OF THE PATELLA	429
CLINIC OF DR. GATEWOOD, <i>Presbyterian Hospital</i>	
A STRANGULATED EPIGASTRIC HERNIA	439

attention to the radical removal not only of the gall bladder but also the entire length of the cystic duct. As this is a small tube somewhat tortuous and in certain cases obliterated it is

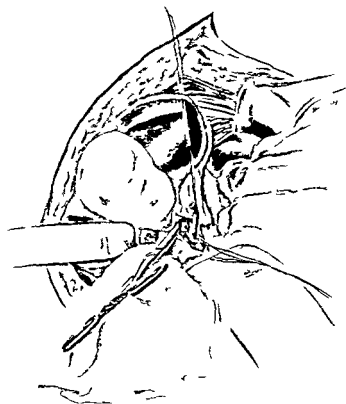


Fig. 6—Cystic duct straightened by traction and ligated close to common duct

by no means easy to be sure we have amputated it at the actual junction point with the choledochus. The technic which I now show is a simple and easy method of ensuring its total removal. As you know the bent forceps usually placed upon the duct

can be applied either with or without a subperitoneal dissection, that is, we may clamp the whole pedicle or we may split the serosa and isolate the cystic artery and cystic duct so as to ensure that only these structures are seized. The latter is the method of choice of all careful surgeons, inasmuch as clamping the ligament without first opening the peritoneal fold, as one would seize the broad ligament in a hysterectomy, involves some danger of injury to the common duct. The technic I now employ includes the use of the clamp for the distal side only,

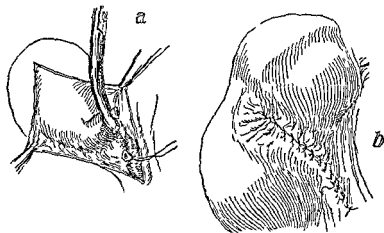


Fig 77—*a*, Gall bladder in process of enucleation, *b*, peritoneum closed over site of gall bladder.

and, as you note, a fine aneurysm needle with ligature on the proximal side which I tie firmly before dividing the duct. As you see (Fig 76), I now have this duct anchored to the silk ligature, and as I make traction upon it can gradually free it cleanly down to the wall of the common duct. You will notice that it is angulated and slightly longer than we would expect, that it lies almost in contact and parallel to the common duct for 1 to 2 cm. Now, had I grasped it along its insertion with these duct forceps, I would have had to leave either a considerable piece behind or else injure the common duct with the edge of the forceps, but as I stretch with the traction of this

ligature, I can bring it completely into view, and I can now make a second amputation under the ligature very close to the outlet. This will complete the removal in this case, but in many other instances I deem it better not to ligate, but to cut it close and introduce a probe, split the common duct and explore it in both directions, introducing then a T-shaped tube which will permit of choledochus drainage during the after treatment.

The remaining steps of the operation are a separate ligation of the cystic artery and the subserous enucleation of the body and fundus of the gall bladder with closure of the peritoneal flaps so as to obliterate the raw surface next to the liver (Fig 77). In this case I shall close the wound without drainage, as I feel sure that the sutured cystic duct, again reinforced with peritoneal covering will not leak bile after absorption of the ligature. This has been advocated by Willis, of Richmond, and is no more to be condemned than a similar procedure with the vermiform appendix or fallopian tube. But it is not well adapted to cases of cholangitis or severe sepsis in which I feel it best to drain—preferably through a stab wound just in front of the right kidney—lest the peritoneal stump leak some bile during the healing.

USE OF KANGAROO TENDON AND SPUN THREADS OF TENDON AS SUBSTITUTES FOR CATGUT

I wish to call your attention in this operation of simple inguinal herniotomy to the technic of the animal ligature employed Throughout this operation I shall use no catgut but only kangaroo tendon in the form of natural strands and also in the form of spun tendon fiber for smaller sutures and ligatures For the deep rows of sutures I am using four mattress stitches of kangaroo which you see is very stout and composed of parallel fibers The tendon which I hold up is thoroughly dry having been taken from strong alcohol and as you notice is very coarse and splits spontaneously into three fairly large threads Each of these threads is larger and much stronger than No 2 chromic catgut so that this one specimen of tendon furnishes three strong sutures

Up to about a year ago I used the tendon only for the deep row of sutures in herniotomy the outer rows and vessel ligatures being catgut Inasmuch as numerous cases of defective catgut have been reported from many of our best clinics especially during the past winter we became dissatisfied with chromicized catgut and I made my second row also of the tendon choosing the slender strands In the course of splitting these strands I noticed the tendency of the material to shred into small skeins of cottony fiber which could readily be spun into a comparatively smooth type of thread By combing pounding and teasing we soon found that we could convert dry kangaroo tendon into a material resembling loose silk or cotton fiber that is small skeins of fine filaments These in turn could be spun by twisting with the fingers into fairly uniform threads of a sufficient length having great strength and we have substituted such threads for ligatures and sutures in various operations thus doing away entirely with the use of catgut in wounds It is true that most of our troubles have been from the chemical

irritation of the catgut, and some gut has been very good, but I have found the results consistently better with tendon, and I am positive that we have far less local and general reaction, and practically never serous or purulent collections around the knots or ligatures.

It would be comparatively simple to manufacture this spun thread by machinery, and I have such threads prepared for my clinic in such quantity that they can be kept on spools and reels like ordinary catgut. In the meantime we are thoroughly converted to the idea of keeping chromicized, iodized or formalized catgut out of our patient's wounds, and do not expect ever to return to their use.

MULTIPLE DRILLING OF FRACTURES—AN OLD-FASHIONED OPERATION REVISED

Summary Failure of the 'Lane technic' to insure aseptic healing the Parham Martin band as a cause of non union the Brainard drill—technic—twenty holes better than ten

THE complications and drawbacks to the use of plates and foreign bodies in simple fractures of the long bones are far too common. In assisting in the preparation of the monumental book of Dr Kellogg Speed on Fractures and Bone Injuries the writer and I, working in two hospitals used Lane plates, intramedullary bone-pegs, and Parham Martin bands in upward of a thousand recent injuries. Knowing that in the best of clinics these appliances had given a large percentage of infections and bad results, one of us, Dr Speed, made a special trip to London, and in two or three months thoroughly studied Lane's own work and analyzed his methods as carefully as possible. What we termed the "Lane technic," which has been studied by both of us personally under Mr Lane, we then adopted in its most rigorous form especially in Cook County Hospital, where I was enabled to assign a very large operative material to our clinic.

As you know Lane's technic implies that nothing except steel instruments thoroughly boiled shall touch the inside of the wound, no fingers, however carefully gloved no needle or thread which has touched the fingers and nothing but the steel goes within the skin. This means that all ligatures must be knotted with a pair of forceps and that all needles must be threaded without handling. All instruments must be handed by the nurse with forceps or special tongs. While at first it seems clumsy and tedious, one soon acquires a facility which makes the operation as speedy as the older methods.

In spite of our almost religious care in these respects, we had no absolute immunity from secondary infection in the use of bone-plates, wires, bands, and intramedullary pegs, although it was our claim and I think justly, that we had reduced them to

a minimum. Neither do I find in the results of clinics here and in other large cities that they have such immunity. It has, therefore, been my constant aim to find some substitute for the routine use of these crude appliances.

These two cases, a fracture at the lower third of the tibia and one at the middle third of the radius, illustrate the imper

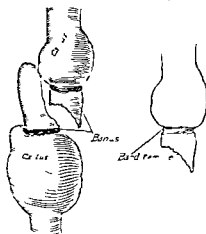


Fig 78.—The former incision was reopened down to the seat of the re-fracture. There was no evidence of any infection in the soft parts. The fragments were exposed and showed the condition as seen in the accompanying drawing. The bands had been placed separately around each fragment and were applied so tightly that they were removed with great difficulty and there was a distinct depression in the bone where the bands had been placed around

fect success attending the use of the Parham Martin band, one of the simplest and mechanically most perfect of the metal appliances. No means can be found mechanically better than an encircling band to hold some oblique fractures. I have always used wire circlets and later kangaroo tendon encirclements on oblique fractures of the femur, tibia, humerus, and other bones, but the Parham Martin band is extremely easy of application and gives stronger support, so that one is tempted

to employ it whenever the obliquity of the fracture makes it spiral. These two cases and two others both in the tibia which I am now watching were all corrected this way. All were cases of non union with the bones in perfect apposition which non union I can only attribute to the cutting off of the nutrition by the powerful band. As you know we set this band in position with a powerful screw tractor and thus the distal portion of the fragments have their periosteum strangulated. Figure 78 shows how these distal ends apparently become atrophic and while not septic have brought about delayed union. After waiting from six to ten weeks while the x-ray showed a perfect relation of the fragments the fact of non union became too obvious to be ignored and in these 4 cases above cited I had to remove the band by a cutting operation. In all but one case the parts were healed and aseptic. We had now in each of these 4 cases to deal with an ununited fracture in most ideal apposition and I am positive that the constricting action of this band was responsible for the delayed repair.

Now non union or delayed union is one of the old complications of fracture both simple and compound and was very well dealt with by our predecessors by that old fashioned operation done with a Brainard drill. Brainard a pioneer surgeon of Chicago and the West early discovered that all ununited fractures could be made to repair by perforating their adjacent ends with multiple drill holes. One of the drills in his outfit had a very broad end and was intended to pass between the opposing fragments and when rotated it tore out the interposed threads of fascia. But most of the drilling was a mere perforation preferably obliquely from one fragment across to the other. Thus from six to twenty small holes such as one would have made were a saw used were made to irritate the end of these fragments. This could be done through one to two minute punctures and the wound immediately sealed. Within a few days after such treatment rapid hyperplastic irritation and new bone formation took place. In ten to fourteen days if there was no sharp osteitis and swelling around

a minimum. Neither do I find in the results of clinics here and in other large cities that they have such immunity. It has therefore been my constant aim to find some substitute for the routine use of these crude appliances.

These two cases—a fracture at the lower third of the tibia and one at the middle third of the radius—illustrate the imper-

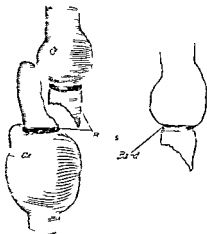


Fig 78.—The former incision was reopened down to the seat of the fracture. There was no evidence of any infection in the soft parts. The fragments were exposed and showed the condition as seen in the accompanying drawing. The bands had been placed separately around each fragment and were applied so tightly that they were removed with great difficulty and there was a distinct depression in the bone where the bands had been placed around them, due to pressure atrophy. The callous formation apparently stopped abruptly at the point where the bands were applied. This was especially true of the lower fragment. There was lateral overlapping of the fragments to the extent of about 2 inches.

fect success attending the use of the Parham Martin band—one of the simplest and mechanically most perfect of the metal appliances. No means can be found mechanically better than an encircling band to hold some oblique fractures. I have always used wire circlets and later kangaroo tendon encirclements on oblique fractures of the femur, tibia, humerus and other bones, but the Parham Martin band is extremely easy of application and gives stronger support so that one is tempted

to employ it whenever the obliquity of the fracture makes it spiral. These two cases and two others, both in the tibia, which I am now watching, were all corrected this way. All were cases of non union with the bones in perfect apposition, which non union I can only attribute to the cutting off of the nutrition by the powerful band. As you know, we set this band in position with a powerful screw tractor, and thus the distal portion of the fragments have their periosteum strangulated. Figure 78 shows how these distal ends apparently become atrophic and, while not septic, have brought about delayed union. After waiting from six to ten weeks while the x-ray showed a perfect relation of the fragments, the fact of non union became too obvious to be ignored, and in these 4 cases above cited I had to remove the band by a cutting operation. In all but one case the parts were healed and aseptic. We had now in each of these 4 cases to deal with an ununited fracture in most ideal apposition, and I am positive that the constricting action of this band was responsible for the delayed repair.

Now non union or delayed union is one of the old complications of fracture, both simple and compound, and was very well dealt with by our predecessors by that old fashioned operation done with a Brainard drill. Brainard, a pioneer surgeon of Chicago and the West, early discovered that all ununited fractures could be made to repair by perforating their adjacent ends with multiple drill holes. One of the drills in his outfit had a very broad end and was intended to pass between the opposing fragments, and when rotated it tore out the interposed threads of fascia. But most of the drilling was a mere perforation preferably obliquely, from one fragment across to the other. Thus from six to twenty small holes such as one would have made were a saw used were made to irritate the end of these fragments. This could be done through one to two minute punctures and the wound immediately sealed. Within a few days after such treatment rapid hyperplastic irritation and new bone formation took place. In ten to fourteen days if there was no sharp osteitis and swelling around

a *minimum* Neither do I find in the results of clinics here and in other large cities that they have such immunity It has therefore been my constant aim to find some substitute for the routine use of these crude appliances

These two cases a fracture at the lower third of the tibia and one at the middle third of the radius illustrate the imper

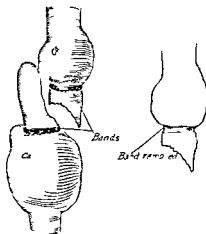


Fig 78—The former incision was reopened down to the seat of the fracture There was no evidence of any infection in the soft parts The fragments were exposed and showed the condition as seen in the accompanying drawing The bands had been placed separately around each fragment and were applied so tightly that they were removed with great difficulty and there was a distinct depression in the bone where the bands had been placed around

fect success attending the use of the Parham Martin band one of the simplest and mechanically most perfect of the metal appliances No means can be found mechanically better than an encircling band to hold some oblique fractures I have always used wire arclets and later kangaroo tendon encirclements on oblique fractures of the femur tibia humerus and other bones but the Parham Martin band is extremely easy of application and gives stronger support so that one is tempted

CLINIC OF DR A J OCHSNER

AUGUSTANA HOSPITAL

FRACTURE OF HUMERUS

Summary Fracture of upper end of humerus in a child six years of age failure to obtain proper reduction by external manipulation treatment by internal fixation with Lane plate postoperative dressing and care

THIS case is that of a boy six and a half years of age, who broke his shoulder last Wednesday, five days ago. An attempt was made to reduce the fracture by manipulation, and the x ray shows to what extent this was accomplished (Fig 79, a). The upper end of the lower fragment touches the lower end of the upper fragment to the extent of about 1 cm but the upper fragment is only 4 cm long, and it was found impossible after a very careful attempt under an anesthetic to further correct the position of the fragments. It is very likely that we will find that the lower fragment is perforating the deltoid muscle and has been caught in the fibers of this muscle, and that this is preventing its adjustment.

We will make an anterior incision (Fig 79, b), drawing the deltoid muscle backward and exposing the fragments, and then we will apply a Lane plate. The important points in this operation will consist, first, in getting an absolute adjustment, so that the two ends of the bone are in precisely the position in which they were before the fracture occurred. This will be an easy matter to accomplish in this case because the fracture is in the form of a fork and by placing the projection in the upper fragment into the depression in the lower fragment we will succeed in getting a perfect adjustment.

The next important point is to have a steel plate that is strong enough to hold the bone in place and still short enough not to interfere with the shoulder joint.

the broken ends, the drilling was repeated. Thus in one or two stages the exudation of the provisional callus was so stimulated that bony union rapidly followed.

In this case of the forearm you will observe the spindle-shaped enlargement around the radius at its middle, which I showed you three weeks ago with a flail like fibrous union six months after injury. The Parham Martin band which was used, and which I removed had given no union.

Exactly identical conditions were found in this young woman's leg from which I removed a Parham Martin band one month ago. For six months the band had caused no trouble until I ordered her to walk upon the limb, after which a slight sinus developed, due to the mechanical trauma rather than an infection. I am now drilling with an electric rotary hand drill through a single opening about a dozen holes obliquely from one fragment to the other. Of course, we must ordinarily employ a general anesthetic. No cast will be used in this case, as we already have the fibula well united and a strong fibrous union with only slight mobility.

Note—Four weeks after this operation a large provisional callus was developed, and it was found that the tibia had firmly united.

I believe that the most powerful agent in our hands to institute either as primary or secondary measure is the perforation of the broken bones by a drill. Probably some of the value of wiring bones or of plating bones comes from excitation of the drill holes. I am able to demonstrate beyond doubt that the drilling of broken bone ends invariably sets up free deposits of the callus and brings about union.

Sometimes the drilling must be repeated in from ten to four teen days, or even a third time since the reaction to it is much slower in some individuals than others. Therefore we have been driven by experience thoroughly to pierce and perforate in ten or twenty places rather than trust to a smaller number of bone punctures.

CLINIC OF DR A J OCHSNER

AUGUSTANA HOSPITAL

FRACTURE OF HUMERUS

Summary Fracture of upper end of humerus in a child six years of age failure to obtain proper reduction by external manipulation treatment by internal fixation with Lane plate postoperative dressing and care

THIS case is that of a boy six and a half years of age, who broke his shoulder last Wednesday five days ago. An attempt was made to reduce the fracture by manipulation and the x-ray shows to what extent this was accomplished (Fig 79 a). The upper end of the lower fragment touches the lower end of the upper fragment to the extent of about 1 cm but the upper fragment is only 4 cm long and it was found impossible after a very careful attempt under an anesthetic to further correct the position of the fragments. It is very likely that we will find that the lower fragment is perforating the deltoid muscle and has been caught in the fibers of this muscle and that this is preventing its adjustment.

We will make an anterior incision (Fig 79 b), drawing the deltoid muscle backward and exposing the fragments and then we will apply a Lane plate. The important points in this operation will consist, first, in getting an absolute adjustment, so that the two ends of the bone are in precisely the position in which they were before the fracture occurred. This will be an easy matter to accomplish in this case because the fracture is in the form of a fork and by placing the projection in the upper fragment into the depression in the lower fragment we will succeed in getting a perfect adjustment.

The next important point is to have a steel plate that is strong enough to hold the bone in place and still short enough not to interfere with the shoulder joint.

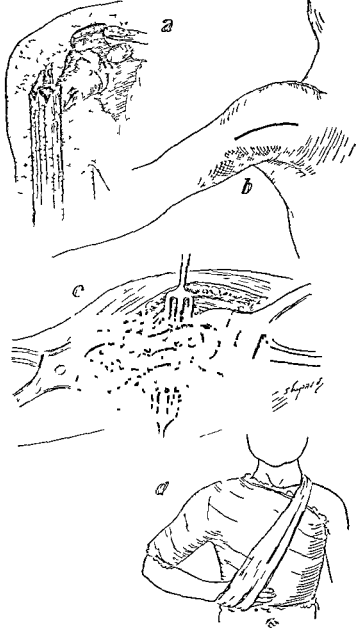


Fig 79—Fracture of upper end of humerus *a* x Ray appearance of fracture
b line of incision *c*, application of Lane plate *d* final dressing

The most important point is of course to perform the operation in an absolutely aseptic manner. This we will do by carrying out Lane's directions to the letter. Dr. Percy and I have performed the operation more than 150 times and in less than 6 per cent of our cases has it been necessary to remove the plate. If the operation is not performed on the absolute conditions laid down by Lane more than half the plates have to be removed afterward because of some slight infection.

I think we can make this adjustment by taking the anterior route and by going in just underneath the anterior edge of the deltoid muscle. We touch absolutely nothing with our hands. The dissection down to the bone is carried out with the greatest gentleness. The tissues are dissected with a sharp scalpel and they are not traumatized unnecessarily in any way. The retractors are applied with care and gentleness and the amount of force applied to them is sufficient only to hold them in place and not sufficient to traumatize unnecessarily. An area sufficiently large for the application of a Lane plate is freed by separating the muscle leaving the periosteum in place. The upper fragment projects into the fibers of the deltoid muscle it is freed from this entanglement and then each of the fragments is grasped by means of a pair of lion jawed forceps which are applied carefully so as to reduce the traumatism to a minimum and with these the fractured ends are approximated so that a perfect adjustment is made.

While the fragments are held in this accurately adjusted position a Lane plate 12 cm. long is placed over the anterior surface of the bone. A hole is drilled slightly smaller than the screw to be applied at the upper end of the Lane plate. The first screw is then inserted holding the upper end of the Lane plate in place but this screw is not forced down to its greatest extent at the present moment. The next hole of the same size is drilled through the lowermost hole of the plate and a screw inserted in the same manner. Then the third and fourth holes *are drilled and the screws applied successively*. Now that all of the screws are in place they are all successively tightened until they are permanently set as tightly as they can be forced

by means of a screw-driver and hold the bone in perfect position with great firmness (Fig 79, c) The tissues are then sutured by means of fine catgut in three layers and the skin sutured with either fine catgut or horsehair An ordinary antiseptic dressing is applied and then a plaster-of Paris cast, including the chest, arm, and forearm the arm being placed nearly at right angles with the body and the forearm about at right angles with the arm (Fig 79 d) This will prevent the boy from making any sudden motion which might break the Lane plate We will leave this cast in place for a period of five weeks when it will be removed and an ordinary shoulder-cap splint will be applied

In the case of an adult we would permit the patient to be up in a day or two In the case of a child it would depend entirely upon the temper and obedience of the youngster If he is head strong, he will be kept in bed the entire time If he is sensible and obedient, he may be permitted to be up in a few days

UNUNITED FRACTURE OF THE HUMERUS

Summary Ununited fracture in a woman thirty nine years of age cause of non union care of musculospiral nerve importance of complete hemostasis

WE have another case of fracture of the humerus for operation this morning, this one being an ununited fracture which we shall treat with either a bone graft or a Lane plate, according to the condition found on exposing the bone

This patient is a woman of thirty nine years In 1917 she fell backward on the sidewalk striking her elbow She heard a snap near the elbow and the arm became powerless A splint was applied for seven weeks, when it was removed and the patient began to use the arm she noticed an undue amount of lateral motion This has increased until at the present time she is unable to raise the arm to a horizontal position She can use the arm for lifting and has good use of the fingers and hand She complains of neuralgic pains in the arm

Examination shows a fibrous union of the fracture at the junction of the lower with the middle third of the bone with considerable callous formation There is $\frac{1}{2}$ inch shortening of this arm

We will have to be careful in making this incision not to cut the musculospiral nerve which you know comes around the bone very near the point of this fracture I am splitting the muscle-fibers in order to protect the nerve There are two points I want you to bear in mind the first is to get accurate hemostasis and the second to be careful of the nerve As long as you have the nerve before you you are safe In this case the musculospiral comes around the humerus a little lower down than in the average case Here we have found a definite reason why union has never occurred There is a piece of fascia between the ends of the fragments I must dissect out this fascia in order to give the bone a chance to unite Now you see the

position of the bone is perfect, and I will insert a Lane plate in the same manner as I did in the first case this morning. The nerve will be protected by this muscle. We now remove the constrictor, and if there is any bleeding we will ligate the vessels. We are closing the wound exactly as in the previous case.

FRACTURE OF THE PATELLA

Summary Comminuted fracture of patella in a man of sixty treatment by suture with chromicized catgut history of silver wire for suture comparison of results following operative and non-operative treatment importance of early mobilization

THIS patient a man sixty years old entered the hospital with a comminuted fracture of the left patella last Friday morning. He also had an oblique fracture of the lower end of the right fibula. These fractures were the result of an automobile accident. The patient was shocked considerably so we put him in bed, elevated the foot and kept him quiet for a few days in preference to operating at once.

The knee is filled with blood-clots but the hemorrhage has undoubtedly stopped so that having applied an Esmarch constrictor I am confident that we still have very little if any hemorrhage. We will take the same aseptic precautions as we did in the last case in which we applied a Lane plate in an ununited fracture of the humerus.

We make a horseshoe incision and lay back the skin flap in order to expose the comminuted patella. There is only a small fragment that remains attached to the ligamentum patellæ. He must have given this patella a tremendous blow because it is broken into a number of pieces and the lower fragments are separated 4 cm. from the upper. All the clotted blood from the broken edges of the patella is removed and from the cavity in the joint in order that we may be able to get a perfect approximation of the various fragments of this patella.

Our first suture extends through the internal lateral ligament bringing the fragments together on the inner side. The next suture is applied to the external lateral ligament which brings the external fragments in perfect apposition. Now we adjust the various bone fragments so that each fragment is put into its own place. The sutures are applied so that the edges are carefully adjusted.

For many years we have sutured all of our fractured patellæ with chromicized catgut. It is now twenty three years since we abandoned the use of silver wire. The reason for abandoning silver wire was first that we found that our results were perfect with the use of chromicized catgut and second because of an experience I had in a clinic of the University of Edinburgh. Professor John Chiene was operating a very bad inguinal hernia in his clinic. I had just visited one of the German clinics where they were closing these hernias with silver wire and so I asked Professor Chiene whether he had ever used silver wire in these cases. He said he never did and for a very good reason. He said there was a surgeon in Edinburgh who operated with silver wire thirty years ago and he was still taking out the wire for him so that set me to thinking and I recalled at that time quite a number of cases in which the patients who had been operated with silver wire elsewhere later on came to our clinic to have the wire removed. At that time I was chief assistant to Professor Nicholas Senn in charge of the clinic at Rush Medical College and we had patients come who had been operated with silver wire from all parts of the country greatly dissatisfied with the primary operation because they had to be annoyed by a second operation for its removal. Our results have been very satisfactory with chromicized catgut and we have adhered to its use ever since.

You see we have carefully adjusted the bone in this case with chromicized catgut. It is sufficient to hold the bone in position until union has taken place. Now we turn our flaps back and we have a perfect adjustment so we carefully suture the fascia over the anterior surface of the patella.

I had this interesting experience in a patient entering the hospital who had broken his left knee-cap. The right knee-cap had been broken in exactly the same way by falling upon a stone pavement. As it happened both fractures occurred precisely in the same manner in fact on the same pavement. The injury was exactly alike in both patellæ. In the first fracture of the right patella the treatment employed was the usual treatment of *immobilization* to the best possible extent by means

of a posterior splint of adhesive plaster strips. After three months the patient was able to walk with a cane and to perform the duties necessary in his office, but he never was able to walk without a lump. His left knee-cap was operated according to the method which has just been illustrated to you. In two weeks the patient was able to go home and walk with a cane, and after five weeks he was able to take up the work in his office, walking without a lump, and three months after the injury occurred his left leg was as good as ever. There was not the slightest lump or hitch on this side, while his right limb in which he broke the patella four years before was still lame. It is now more than twenty years since this operation was performed. I see the patient occasionally and he still laments the fact that his right limb was not treated by the operative method because as his age increases the difficulty continues to become worse, while his left limb is perfect.

This has been our uniform experience with this operation, and I am confident that the patient before you will have a similar experience. For a number of years we applied plaster-of-Paris casts in these cases. This we have abandoned entirely. We apply an ordinary dressing for about ten days, when the sutures are removed, and then an Unna's paste dressing is applied extending from a point 15 cm. above the patella to a point 15 cm. below. This dressing is elastic and permits the patient to make active motion. He is permitted to walk on this leg at this time, and in five to six weeks he can take up his occupation. In this manner the muscles of the thigh do not show the least degree of atrophy, so that at the end of six weeks, when healing is perfect, the limb is quite as strong as it was to begin with. We have patients upon whom we have performed this operation in many occupations, one of them, a house painter, was able to take up his work climbing ladders and scaffolds at the end of six weeks without any difficulty.

DOUBLE HARELIP AND CLEFT PALATE

Summary Technic of repair—importance of conserving premaxilla—placing of sutures—method of relieving tension on sutures—concentrated tincture of benzoin for dressing

THIS patient has the characteristics of a partially formed double harelip with wide open cleft palate. The nose is flattened down against the face on both sides and the intramandibular portion of the upper jaw protrudes (Fig 80 *a, b*)

The first and probably the most important step in this operation must consist in the adjustment of the intramandibular portion of the upper jaw in order to secure a proper support for the lip which we are to construct. Many of the earlier operators simply cut away this portion because of the greater convenience, and this invariably left a very unsightly deformity. In order to replace this portion of the jaw a triangular segment of the vomer, which has pushed this portion forward, should be cut away. The lateral edges of this portion should be freshened and also the ends of the alveolar processes on each side, and the intervening portion should be carefully sutured so as to make a continuous alveolar process. In applying these sutures great care should be taken not to interfere with the new teeth which are being formed in the jaw. By carefully feeling with a fairly fine needle one can readily avoid these teeth, and by drawing through a fine silk suture threaded double into a fine needle, a silkworm gut suture or silver wire suture can be threaded into the loop of the silk suture and drawn through the tissues without disturbing the teeth. We have found the application of these sutures in the following manner most satisfactory.

Pass a fine needle through the mandible on one side from front to back and then bring it forward over the intermandibular portion, and pass through the edge of this portion again from front to back, and then go to the other edge of the interman-

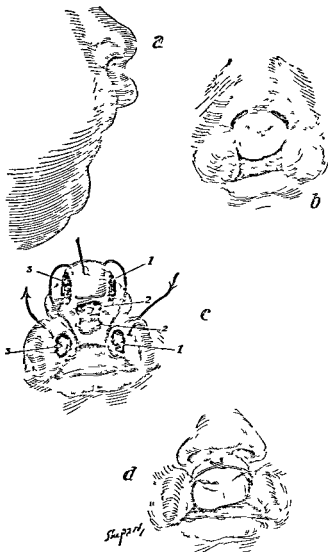


Fig 80 —Double congenital harelip and cleft palate. First stage *a*, Side view of child, note projecting premaxilla *b*, front view *c*, appearance after intermandibular portion has been freed at 2-2 and elevated the places 1-1 and 3-3 are freshened, and a silkworm-gut suture applied as shown *d*, result after tying of suture.

dibular portion and pass the needle from back to front. Then pass it behind the mandibular portion on the other side and pass from behind forward and then tie the two ends. By regulating the tension upon this suture it is possible to hold this fragment in exactly the position one desires (Fig 80, c, d).

In this case the child's strength does not seem to be sufficient to warrant a continuance of the operation because the next step involves a rather greater loss of blood than the present step, and the child is weak. Consequently, we will not complete the operation at the present time, after one or two weeks when the wounds that we have made today will have healed, the child will be able to bear the second operation.

SECOND STAGE OF THE OPERATION

The first stage of this operation was performed nine days ago and now the child has recuperated nicely, so that we may proceed to the closure of the harelip. The object to be attained by this part of the operation consists in producing a lip which has a reasonable thickness and proper depth, and shows the slightest possible amount of deformity because of the scars which may result from the present operation. In order to secure a sufficient amount of tissue to construct this lip without undue tension we will make use of the central portion, trimming the mucous membrane in order to make a rectangular flap (Fig 81, e, f). We next trim the edges of the lateral portions of the cleft in such a manner as to leave the surfaces to be united entirely over the mucous membrane. In order to elevate the septum of the nose and at the same time to increase the depth of the upper lip we make a small lateral incision in the lateral flaps. The corners of the central flap will then be adjusted so that they fit into the angle formed after the lower portion of the lateral flaps have been drawn downward (Fig 81, f). A suture is then applied up to the lateral projecting portion of the lip on each side, and by means of this portion the lip is lengthened and the lateral flaps are applied to the central portion, and all the surfaces are sutured in place (Fig 81, g). The first silkworm gut suture is passed through the lip and

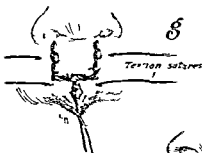
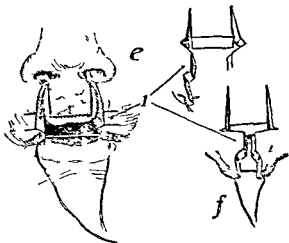


Fig 81—Second stage of operation e The dotted lines are lines of incisions a suture has been passed through the mucocutaneous line of each side of the lip as a guide f appearance after incisions have been made g, tension sutures applied and incision in mucous membrane closed with interrupted catgut sutures h result at conclusion of operation

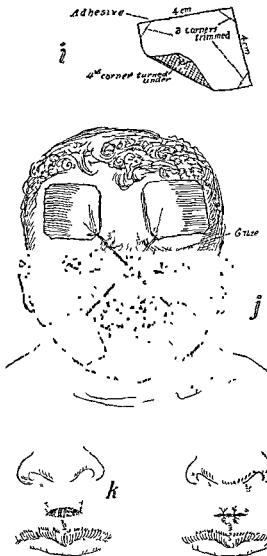


Fig 82—Second stage of operation *i j*, Method of applying adhesive plaster and silk strands in order to relieve tension on suture lines note pad of gauze over bridge of nose to protect the skin from pressure by the strands of silk

k l Third stage of operation Secondary suture of small defect present on tenth day after second operation

left untied. Then the mucous membrane is sutured posteriorly throughout with chromic catgut sutures and then the skin surfaces are sutured with horsehair. After all the suturing has been completed the silkworm gut is tied loosely enough to prevent pressure necrosis and tightly enough to serve as a stay suture (Fig 81, *h*). The lateral flaps are supported by means of rubber adhesive strips 3 cm in diameter, placed one upon the lower portion of each cheek and one upon the forehead, one each side, and these after they have become thoroughly adherent, are approximated by means of fine silk sutures. This will remove the tension from the flaps without causing pressure on them. In order to prevent irritation from pressure of the silk sutures on the bridge of the nose it is well to insert a small piece of gauze at this point (Fig 82, *i, j*).

THIRD STAGE OF THE OPERATION

The second step of the operation in this case was performed twelve days ago. Two days ago when we removed the stitches it was found that there was a slight defect in the middle of the wound (Fig 82, *k, l*). This little defect has been covered with mucous membrane from within, and in order to secure a secondary union at this point it will be necessary to remove this with a fine tenotome and then to apply two small stitches, which will undoubtedly result in perfect healing and give an ideal result.

In these cases we never apply dressings, because they are liable to accumulate mucus from the nose or from the mouth, but after drying the wound carefully we apply concentrated tincture of benzoin, which adheres to the skin and keeps the wound clean and results in healing without scar. It is also worth while to remember that if the superficial sutures are applied with a fine cambric needle without cutting edge and if the horsehair sutures are tied loosely stitch marks are avoided. A cutting needle used in applying these superficial stitches is practically certain to result in ugly stitch marks.

You can see the benefit that comes from our planning a deep lip. After the operation was complete it seemed as though our lip would be a little too deep, but now you can see that the

surplus tissue has almost all been taken up, and that when healing will be finally completed we shall have almost exactly the desirable depth of lip. In case of doubt it is always best to have too great rather than too slight a depth, because such a deformity can be more easily corrected.

The one point that should always be borne in mind in all of these cases is the nutrition of the child. When the child came to the hospital it was suffering from dysentery, and I am convinced that if we had operated at once we would have lost the baby, because the shock would have been just enough to destroy its life. Consequently, we placed the child in the care of our infant specialist, who provided a diet for it which overcame the difficulty, so that the child has gained quite a little in weight since it first came here. We had to put off the operation for about three weeks while the dysentery was being treated.

The children who are brought to the hospital from the country and are not accustomed to steam heat are likely to suffer from slight colds a day or two after reaching the hospital. If these colds are neglected or if the operation is performed while the patient is suffering from this condition, pneumonia may follow, which may destroy the patient. It is far better to permit the infant to become acclimated to the temperature of the hospital and to its surroundings before undertaking the operation.

CLINIC OF DR TRUMAN W BROPHY

ST JOSEPH'S HOSPITAL

HARELIP

Summary Embryology of the jaws and lips—technic of operation for correction of harelip—necessity of plastic work on nostrils at the time lip is repaired

January 15, 1919

THIS child has what we call a partial double harelip. There is a separation of the lip in two places extending about halfway between what should be the vermilion border and the nose. There is also a complete cleft of the palate and a separation of the alveolar process on the left side. The right side is intact. While such a condition of the alveolar processes is occasionally seen, it is comparatively rare. This condition is, of course, congenital, and is due to failure on the part of the tissues to unite in the early development of the child. At the second month in a normal embryo these tissues are united. At that time or earlier, at six weeks, the tongue is of great thickness, occupying nearly all the space between the floor of the mouth and the nose. The bones which enter into the formation of the palate are developed from six centers, two from the horizontal plates of the palate bone, two from the maxillary plates of the maxillary bones, and the two premaxillary bones.

We have another child for operation in which the premaxillary bones protrude. In that case we can bring the bones back and establish a normal arch. It has been the practice among many surgeons to cut off these premaxillary bones and close the fissure in the lip, but the loss of the premaxillary bones produces a deformity which cannot be remedied. It is a great misfortune to have the premaxillary excised. It is bad surgery. The doing of this operation, the bringing of these parts into

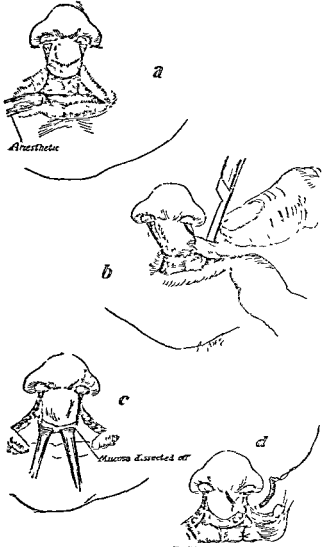


Fig. 83—*a*. First step in the operation consists in the removal of two

position, is absolutely necessary if we would establish a condition just as nearly anatomically normal as possible

We will perform this operation under ether anesthesia. The first step is to close the nose so as to exclude blood when we open the lip. We must make a lip that will present a normal appearance. The nostrils especially the left one, are wider

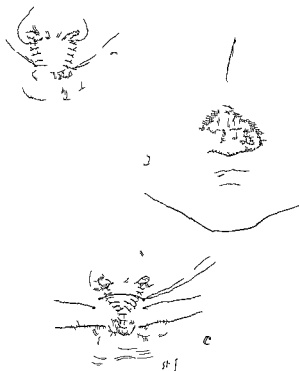


Fig 84—*a* *b* Interrupted horsehair sutures approximating skin (*a*) and mucous membrane (*b*) *c* tension sutures of silkworm gut.

than normal. We remove a wedge-shaped piece of tissue at the lower gap so as to contract the nostril (Fig 83, *a*).

Now we pick up the lip and make the flap by passing the knife obliquely upward through its entire substance (Fig 83, *b*). We carry the knife through the substance of the lip from below upward to reach the incision that I have just made (Fig 83, *c*).

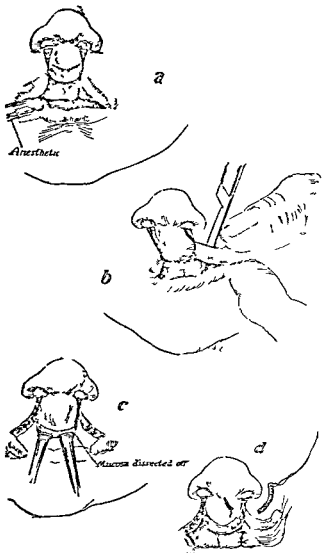


Fig 83—*a* First step in the operation consists in the removal of two wedge-shaped pieces from the floor of the nostrils to permit correct on of the

closed by suture.

always careful not to permit any blood to flow until we are ready to seize the little vessel and close off the circulation

The procedure is the same on the opposite side. We do not need to remove so wide a piece on the right side. The first consideration is always the nose, to get the nostrils right, and then close the fissure in the lip afterward. Now we have formed this nostril and will proceed to the lip. We split the tissues so as to roll out the skin a little more and make it thicker at the border. Otherwise we will have a depression in the lip. Now we will take off this superfluous mucous membrane so that the mucous membrane will not overlap the skin nor the skin overlap the mucous membrane (Fig 83, *c*). Skin is now carefully sutured to skin, and mucous membrane to mucous membrane, using horsehair as our suture material. We have closed this gap and we have to adopt a plan to hold the parts together. We will put in one or two stay sutures all the way across (Fig 83 *d* and Fig 84 *a, b, c*).

We have both these nostrils symmetric. We have a very good nose and a very good lip. We will wash out the boy's stomach so as to get rid of all the blood that has been swallowed. In doing this we avoid a temperature from the absorption of this blood in the stomach. In fact the child would have an abnormal temperature if it had that much blood in the stomach, to say nothing of the operation.

Now we put on some strips of adhesive on the face to hold the parts together. They are very useful and very simple (Fig 85 *a, b*). We have cuffs of cardboard on this child's arms to prevent him from putting his fists in his mouth (Fig 85, *c*). A piece of iodoform gauze is put in the nose for the purpose of excluding secretion from the stitches for a few days—about two or three—until it seals. After we remove the gauze we clean the nose with an applicator. We have nothing here that can absorb secretion. These horsehair stitches are absolutely clean and we are not apt to have any infection.

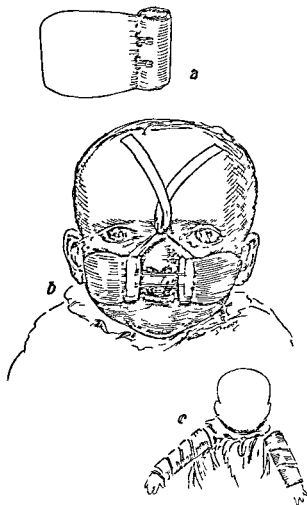


Fig 85—*a, b*, Application of adhesive plaster strips to take tension off of suture lines *c*, cardboard cuffs on arms to prevent patient from interfering at the site of operation

This reduces the size of the abnormally dilated nostril I hold the lip with my finger and arrest the flow of blood We are

CLINIC OF DR CARL BECK

NORTH CHICAGO HOSPITAL

MULTIPLE PAPILLOMATA OF THE BLADDER

Summary Diagram of papilloma and cancer of bladder, operative removal of bladder papilloma—suprapubic incision and ligation of base of tumor by silk ligature—healing by granulation

MRS O G, fifty nine years old, has been suffering for many years with some disturbances of urination but during the last four weeks very severely. The symptoms are strongly indicative of trouble in the bladder. They consist in frequent urination, painful, especially at the end and the sensation of incomplete evacuation of the bladder, a heavy feeling, continuous dull pain the urine at times very strongly bloody, at other times full of pus and sediment of solid material, indicates the presence of chronic cystitis. The microbic flora represents an enormous number of pathogenic and non pathogenic germs although none of the specific tubercular germs are to be found. Cystoscopic examination is impossible the catheterization even is very painful and the catheter strikes a body which prevents the catheter entering the bladder proper. Bimanual palpation through vagina and abdominal wall shows that the bladder contains a large irregular mass, not particularly sensitive, not very hard, somewhat movable. In general the patient does not suffer very much. She has lost some weight, but not to such an extent that one could say that she is cachectic. Summing up these symptoms the diagnosis is between papilloma, stones, and carcinoma of the bladder.

In favor of the stones are some of the subjective symptoms, like the shutting off of urine sometimes suddenly toward the end of micturition but this symptom has been so rare that one could also attribute it to the effect of a very movable papilloma.

feature of the after treatment was the tremendous amount of phosphate deposited on the threads and on the abdominal wall, which transformed the wound into that characteristic of phosphate crust wound, which is so well known to the surgeon operating on such bladders

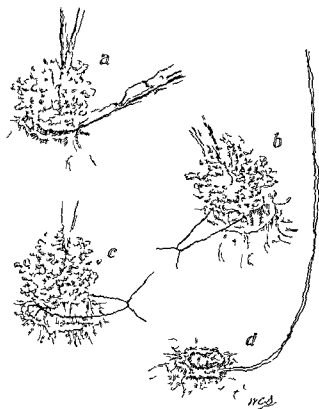


Fig 86—Papillomata of the bladder *a* Mucosa incised *b c*, base of papilloma transfixed and ligated *d* papilloma excised Ligature left long enough to reach out of bladder

Finally, by giving large quantities of lithiated water and fruit juices and carbonated waters, particularly large quantities of fluid, the patient improved so that secondary suture of the bladder could be made, but not before the large sloughs with

Against a carcinoma speaks the absence of cachexia although it is well known that with a carcinoma of the bladder the patient's strength may often be preserved for a long time before the disease really seriously affects the health. The preponderance of evidence therefore is in favor of papilloma although carcinoma is not excluded. An exploration is the only means of diagnosis and possible cure. This exploration is performed as you see in the usual manner. With the patient in the Trendelenburg position I make my incision and open the bladder. As soon as the bladder is emptied we see a very interesting picture. Clustered like the heads of several cauliflower flowers on the front wall of the bladder are numerous projections rounded of the size of a large walnut and two of them close to the bottom near the trigonum overlapping the urethral opening. They look like a large prostate; the tumors are grayish in appearance owing to the deposit of some phosphatic material within the meshes of projecting floating papillary excrescences somewhat of the appearance of a decaying strawberry also similar in color. They are hard on their bottom and broadly sitting upon the mucous membrane with no pedicle but they are freely movable. They are raised out of the bladder as far as possible with their body and the bladder mucosa is incised within its normal structure down to the submucosa then a long silk thread is passed through their bottom and the papillomata are ligated off with this silk thread *en masse* whereupon the silk thread is left long enough to hang out of the bladder. The bleeding during this procedure is comparatively slight altogether four such mass-ligatures are applied leaving the bladder clean from papilloma with four stumps of ligated submucosa three in front and one at the bottom.

The bladder is then washed out thoroughly and without any drainage from above except such as is furnished by the ends of the ligatures hanging out. A catheter is placed into the urethra the wound above is not sutured at all but left wide open (Fig 86).

This patient made a very good although slow recovery. There was no fever and no infection. The only disagreeable

SYPHILIS OF THE STOMACH—RESECTION OF PYLORUS FOR IMPERMEABLE LUETIC STRICTURE

Summary A patient presenting symptoms of total pyloric obstruction, with marked emaciation and a palpable mass operation—the diagnosis—frequency of gastric lues

MR S, fifty one years old Single Referred to me by Dr E, in whose employ he has been for many years and who has known him since he was a young boy This fact is mentioned because Dr E, a good observer, has never noticed any abnormal conditions which would lead him to suspect any kind of ailment of syphilitic nature

When S came under our care he was brought with the diagnosis of ulcer of the stomach by Dr E, most likely carcinomatous with a subsequent enlargement of the stomach, emaciation, and all the symptoms which are so characteristic of cancer He would eat a certain amount of food and it would stay in his stomach for twenty four hours, or even longer, and then he would vomit it up, showing that not a particle of it, except perhaps a little liquid, had seeped through the pylorus or had been absorbed from the stomach wall Sometimes he would vomit it up at once and sometimes he could carry it for a day Of course, it would cause great inconvenience if left in the stomach for such a long time—cramps and even violent pains—but this would occur rarely He was so emaciated that one could see through the abdominal wall the tremendous stomach, reaching down almost to his symphysis when he was standing, and, being very tall, this man had an enormous enlargement There were no other symptoms from any other organ or group of organs, nor were there any pathologic findings At the first taking of the history even the history of a specific infection was denied—not by intention, but because the man really did not think that he had an infection The question being asked, Have you ever had syphilitic infection? he answered in the negative

the sutures had yielded leaving nice granulating wounds in the bladder. These granulomatous ulcers three months after the operation have been greatly reduced in size two of them are scars already one of them is somewhat projecting but yields very well to cauterization with nitrate of silver. The patient is gaining and is free from symptom. but still has a tendency

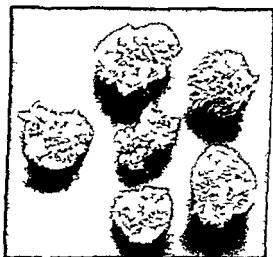


Fig. 87 —Papillomata after removal and immerses in Kayserling's solution

to form small calculi of phosphates which are washed out occasionally.

Figure 87 shows the appearance of the specimens after they had been in Kayserling's solution for some time therefore they are somewhat shrivelled. When they were fresh they gave that beautiful picture in the latter which is so familiar to us resembling that sea animal of the Medusa type with transparent large floating excrescences.

duodenum whereupon the two openings of the stomach and the duodenum were joined by straight anastomosis suturing peritoneum muscularis and mucosa first in the back and then in the front. After this union of stomach and duodenum was completed and gastro enterostomy posteriorly between stomach and jejunum was made the abdomen was closed.

The patient made an absolutely uneventful recovery. He was fed from the third day with liquids from the eighth day with solids gained very rapidly in weight and is now well and able to work again.

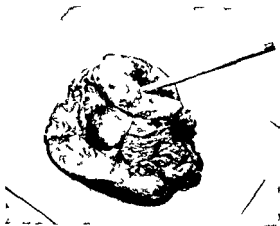


Fig. 88.—Excised syphilitic scar. an attempt has been made to pass a match through the gastric lumen at point of catraxis but without success.

No trace of carcinoma or glandular infection was found during the operation but the specimen removed showed distinct results of chronic inflammatory changes as they are characterized in syphilis (Fig. 88). Going into the taking of the history again we find now that at the age of twenty this man had a distinct lesion an ulcer which was treated with quick silverunctions and K. I. for some time that it had healed without further symptoms.

The microscopic changes of the specimen show typical scars from syphilis.

The examination of his stomach showed retention of all the food, a great deal of mucus, but absence of any pathologic cells indicating carcinoma, and also absence of free HCl and a great deal of free butyric acid. The roentgenographic examination showed that hardly any barium passed the stomach for twenty-four hours. After that time a few barium shadows would appear in the small intestine, but even after forty-eight hours most of the barium was still in the stomach.

There was no distinct filling defect, although the pylorus seemed to be indicated in the picture by a pointed horn like end, in a place where one could feel a distinct tumor by palpation. This tumor was freely movable in the abdomen within a radius of 2 inches. Clinical diagnosis, therefore, was made of a cicatricial stricture of the pylorus, with subsequent hyperplasia, hypertrophy, and distention of the stomach—starvation of the patient.

An operation was proposed and performed. The idea was to make a gastro-enterostomy. When the abdomen was opened a most peculiar picture offered itself: the liver was covered with a greenish yellow scum, and on some portions one could distinctly see scars, evidently due to some chronic inflammatory process. The scum on the liver could not be removed, it was intimately connected and was not an exudate, but rather post-inflammatory residue—regular scar, the liver seemed rather smaller than normal, but the picture was entirely different from a chronic cirrhosis of the liver due to alcohol.

Trying to pass my finger through the pylorus, testing it for its permeability, I found that the tumor was due to chronic induration and cicatrization of the prepyloric region to the extent of about $1\frac{1}{2}$ inches, and that it did not admit into the lumen the point of my little finger. I decided to remove the tumor mass and the whole pylorus and join the stomach again to the duodenum. Temporary compression some distance away from the proposed line of resection was made, and the tumor dissected by straight lines of incision from the stomach. The wound in the stomach is diminished by suturing the mucosa muscularis and peritoneum down to the size of the lumen of the

of these pathologic changes are coming in greater numbers, and it is even possible to make a diagnosis beforehand if the history of the syphilitic infection is manifest or pointed out by the patient. There is a possibility of carcinoma being developed on the basis of a syphilitic ulcer, as we see also elsewhere in the anatomy, for instance, carcinoma of the tongue on the base of a syphilitic granulation, or a carcinoma of the penis on the base of syphilitic ulcer, carcinoma of the uterus, carcinoma of the leg on a base of a varicose specific ulcer. These pathologic combinations have to be considered when we deal with an instance of this kind. I also have had experiences of this class within the stomach, and one of these cases has been reported by one of my associates in a lengthy article on syphilis of the stomach as observed in the Roentgen laboratory.

The syphilitic lesions of the stomach are by no means as rare as we would suppose. Comparing my own experiences with those of other surgeons I must say that I have found many more cases of this affection than others in my operative work, and I suspect that some of my early cases in which I diagnosed carcinoma and which have afterward remained free from symptoms for years although I have not made a radical operation but a palliative gastro-enterotomy, have been such syphilitic obstructions acutely inflamed and indurated so extensive as to make me believe we had to deal with an inoperable carcinoma. Some of these cases I have diagnosed as syphilis during the operation. One of them is so characteristic that I will mention in a few words its history, particularly since one of the best diagnosticians whom I ever met the late Prof. Christian Fenger had diagnosed that particular case as carcinoma and refused to operate. It was the case of a young woman twenty-eight years old rather thin and emaciated with a tumor of the stomach and a large number of irregular tumors of the liver which Fenger took for metastatic carcinoma nodules in the liver. The age of the patient (who afterward consulted me and who had been told by Fenger that she had no more than a month or two to live) induced me to make an exploration and lo and behold! I found the liver studded with typical gummata from the size of a hazelnut to a walnut and the stomach the seat of a tumor looking like carcinoma also other growths elsewhere of the same nature. A very strong antisymphilitic treatment cured the patient fully of her ailment.

Of course no antisymphilitic treatment will be able to cure a cicatricial contraction of the pylorus it will remain an obstruction the scar is the cure of the process as far as the syphilitic nature is concerned the operation is the cure of the mechanical obstacle to digestion. In a large number of cases of explorations of the stomach we are bound to meet with instances of mechanical obstruction, inflammatory growth in the intestinal tract, particularly in the stomach of syphilitic nature. Formerly we were convinced that tuberculosis and syphilis are extremely rare in the stomach but in the last few years accounts

RESTORATION OF CHEEK FOLLOWING EXTENSIVE RESECTION FOR CARCINOMA

Summary Excision of entire thickness of cheek for carcinoma technic for repair of resulting defect—inversion of pedicled flap of skin to replace mucous membrane

MR A F farmer, sent to me by Dr Ch who has had the patient under observation for some time. A tumor is visible on the right side of the face below the eye and in front of the ear which looks as if it were very superficial but on close examination it is found that this tumor is situated very deep and is also protruding to a certain extent into the mouth cavity, corresponding to the same region. In the mouth the protruding tumor is ulcerated and the ulcer which is situated between the last teeth and somewhat in front of the last lower teeth is covered with a greenish necrotic area. The jaws are hindered in their movements by these growths to such an extent that the patient cannot close his jaw firmly nor can he open it more than about an inch between his front teeth. The diagnosis, confirmed by microscopic analysis does not offer any difficulties. It is a carcinoma in one of those localities in which we find it not frequently but occasionally. I have observed quite a large number of such carcinomata.

This case seems to be local as yet. At least no gland of the group which is supplied by lymph from this locality, namely, the posterior submaxillary glands seems to be affected. On closer examination we come to the conclusion that the carcinoma is not very large in extent and that the swelling which we notice is not carcinoma but reactive inflammation caused by the small carcinoma infiltrating the tissues around it—something that we observe also elsewhere as the result of a slow carcinomatous growth. It is an experience which we frequently note that certain kinds of epitheliomatous tumors act like a foreign body and produce considerable reaction around the growth so that the tumor appears much larger and often leads to the

•

,

the wound. A flap is formed now of the shape of a tongue, with its base toward the ear receiving its circulation from that side. In its posterior portion it is within the bearded area of the cheek. This flap is turned inward, doubled on itself, and the tip is sutured accurately into the angle of the mucosa between the two jaws, the sides of the flap are sutured into the mucosa above and below as far as possible (Fig 90). In front near the angle of the mouth mucosa is sutured to mucosa, and skin to skin. This leaves a hole in the cheek of a half moon shape,



Fig 90—Pedicled flap from chin turned inward and tip sutured to mucous membrane at posterior angle of incision

the smaller side of the half moon being formed by the skin flap, the larger side of the same formed by the wound of the cheek (Figs 91-92). The saliva runs into the mouth since the opening of the duct is in the flap and directed downward toward the groove of the lower jaw.

The patient recovered from this operation with primary union and was left in this condition for two weeks until firm union had taken place. Then an attempt was made to close the hole. The tongue shaped flap was cut at its base, but not clear down through all the tissues, and the flap turned with its skin surface toward the mouth and sutured with its half

detection of an initial, still localized growth. This is very favorable, and I think that it gives us a chance for a radical cure in this particular case. We therefore have decided to excise the tumor *in toto*, with allowance of considerable resection of normal mucous membrane around the tumor, removing at the same time all the infiltrated tissue, and then replace mucous membrane by skin, a process which we have repeatedly tried with good success.

The operation is performed in the following manner. An incision starting from the outer angle of the ear, crossing the



Fig. 89—Defect in side of face following resection of carcinoma bearing tissues

height of the tumor directly into the angle of the mouth the tumor is now exposed and by dissection freed on all sides, keeping the knife as much as possible in uninfiltreated tissue and ligating all the vessels as they appear. The duct of Steno shows itself infiltrated and drawn into the area of the tissue, although it is not obstructed. It is taken along. When we reach the mucous membrane we find that we can open the jaw very freely now and we excise the carcinoma taking along about $\frac{1}{4}$ to $\frac{1}{2}$ inch of normal mucosa with it. That leaves a defect of about the size of a half-dollar in the mucous membrane of the mouth (Fig. 89). The duct from the parotid is within

It was not expected to have primary union but only to diminish the aperture in the cheek, so that only a small opening remained which could be closed to much better advantage some months later when the union of the cheek inside was firmer. After a week the patient had healed so far that only a very small opening in a depression on his cheek remained through which no saliva dripped, but through which air could be pressed and some food liquid especially occasionally escaped. In the meantime



Fig. 93.—After second operation mouth can be opened spontaneously about $\frac{1}{4}$ inch

the skin flap in the mouth had healed firmly the hair had grown to about $\frac{1}{4}$ inch in length and was falling out spontaneously, the skin was already somewhat rose and the hair follicles showed distinctly as black spots in the rose surface. The mouth could not be opened spontaneously more than about $\frac{1}{4}$ inch (Fig. 93) but with the aid of a Heister speculum such as is used to pry open the jaws during anesthesia the patient was treated twice daily and within a few weeks could open his mouth spontaneously about 1 or $1\frac{1}{4}$ inches.

moon surface into the freshened wound in the cheek mucosa. It is true that an accurate suture could not be made, the mouth



Fig 91 — Anterior portion of incision (at angle of mouth) closed by approximating skin to skin and mucous membrane to mucous membrane.



Fig 92 — Condition at conclusion of first operation

did not allow a wide opening and the operation had to be performed under local anesthesia, only two stitches were placed in mucosa and skin and the adaptation was necessarily poor

CLINIC OF DR CARL B DAVIS

PRESBYTERIAN HOSPITAL

PLASTIC REPAIR OF THE DELTOID MUSCLE

Summary Detachment of deltoid muscle from its bony origin following treatment of infected compound fracture of clavicle with complete loss of ability to abduct arm—treatment by fat fascia transplantation result after ten weeks

THIS patient, a man of thirty, developed an osteomyelitis of the right clavicle following a compound fracture. The bone was cureted a time or two, and this, with a considerable amount of suppuration of the soft parts, resulted in a detachment of the greater part of the deltoid from its bony origin.

On admission to our service one year after the accident, and about three months after the wound had closed, the patient showed two parallel scars, one over the clavicle and one $\frac{1}{2}$ inch lower. He was unable to abduct the right arm. The actions of the latissimus dorsi, biceps pectoralis, and other muscles attached to the humerus were normal. The sensation in the skin of the arm in the region supplied by the circumflex nerve was normal. \times Ray plates showed a deformed clavicle. The extremity was normal in other respects except for a slight flattening of the tip of the shoulder.

An incision was made 1 inch below the clavicle, extending from the tip of the acromion process to the middle of the clavicle. The skin was dissected upward from over the posterior triangle of the neck until the trapezius was exposed. A second incision at right angles to the first was carried downward over the shoulder and the skin turned back until the deltoid was found contracted down toward its attachment to the humerus. Trac-

to deltoid failed to be cut

Today several months after the operation just described we find that there is a very small opening in the cheek through which only air passes and a little irregular depression about this opening (Fig 94) We close the fistula and fill in the depression in the following way



Fig 94 Just preceding last (third) operation Note depression in cheek with fistula at its center which were both obliterated by a single plastic procedure.

Sharp incisions are made into the border of the depression the skin within the same is fully re-ected and the border flared outwardly by sutures so as to make an elevation at this spot instead of a depression This elevation must be a so exaggerated one because gradually it will give way to a falling in which will probably remain even with the rest of the cheek if it has been made prominent enough in the first place

wound with the fat layer down to prevent the flap becoming adherent to the capsule. The flap was attached by chromic gut to the trapezius and clavicle. The arm was brought out to a right angle with the trunk, and the deltoid was sutured as far up on the flap as possible. The skin was then closed in the usual manner (Fig 95). A triangle splint was adjusted, and the arm, splint, and chest were enclosed in a plaster-of Paris cast.

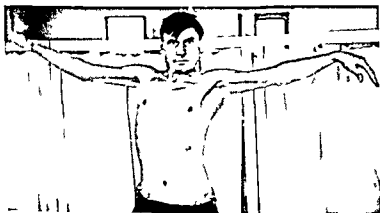


Fig 96—Ten weeks after operation. Patient can abduct arm and hold it at right angles with the body.

This was kept in place six weeks. On removal of the cast the patient was encouraged to abduct the arm slowly at first and later with all possible vigor. Later he was put through rather vigorous wand exercises.

It is ten weeks since the operation, and the man is about to go to his home. As you see he is now able to hold the arm in a horizontal position (Fig 96).

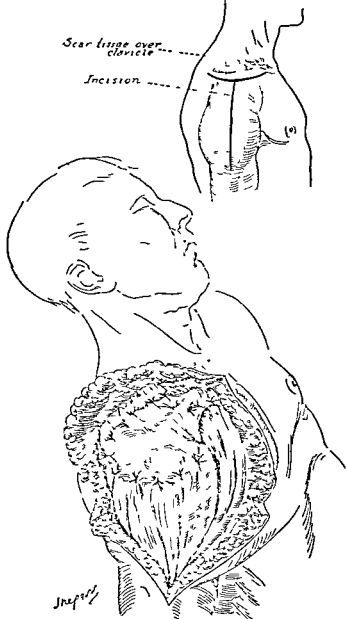


Fig 95—The lesion was exposed through a T-shaped incision and the gap between the deltoid muscle and its normal origin bridged by the implantation of a piece of fascia from the thigh

wound with the fat layer down to prevent the flap becoming adherent to the capsule. The flap was attached by chromic gut to the trapezius and clavicle. The arm was brought out to a right angle with the trunk, and the deltoid was sutured as far up on the flap as possible. The skin was then closed in the usual manner (Fig 95). A triangle splint was adjusted, and the arm splint, and chest were enclosed in a plaster-of Paris cast.

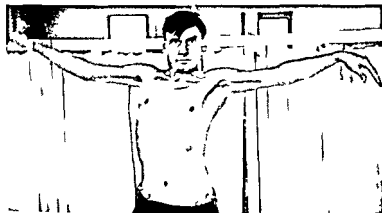


Fig 96—Ten weeks after operation. Patient can abduct arm and hold it at right angles with the body.

This was kept in place six weeks. On removal of the cast the patient was encouraged to abduct the arm slowly at first and later with all possible vigor. Later he was put through rather vigorous wand exercises.

It is ten weeks since the operation and the man is about to go to his home. As you see he is now able to hold the arm in a horizontal position (Fig 96).

RECURRENT DISLOCATION OF THE PATELLA

Summary History of case presented technic of operative treatment pathology of dislocation of patella

THE patient a young woman of twenty four slipped during a basket ball game three years ago and fell to the floor She was unable to use the knee until the patella which was lying external to the supracondylar ridge had been replaced in its normal position The dislocation has been increasing in frequency until the present time when there is almost daily a sudden giving away of the knee and the patient drops to the floor or street without warning

There is no pain in the joint except at the time when the patella slips out over the ridge Formerly there was some swelling of the joint following dislocation but recently there is no after-disturbance There is no muscular trouble and no other deformity The x-ray examination of the joint is negative

There are various operative methods of holding the patella within normal bounds Some are very complicated and involve opening of the joint cavity Some of the more simple methods have been quite efficient In this case a curved incision (Fig 97) was used to expose the patella and its tendinous attachments The quadriceps tendon was drawn inward and attached to the medial portion of the sheath of the vastus internus muscle The medial portion of the capsule of the joint was plicated The patellar tendon was split upward from its tibial attachment and the external or lateral half cut loose from its bony attachment and turned inward at a right angle across the remaining attached portion and sutured to the periosteum of the tibia The skin was closed without drainage and a plaster cast adjusted The joint was kept fixed for two weeks and then passive flexion for several days and later cautious active flexion of the joint to 50 per cent of function The patient left the hospital three weeks after operation—using crutches for one week and a cane

for a succeeding week. There has been no subsequent dislocation and the patient has free use of the joint.

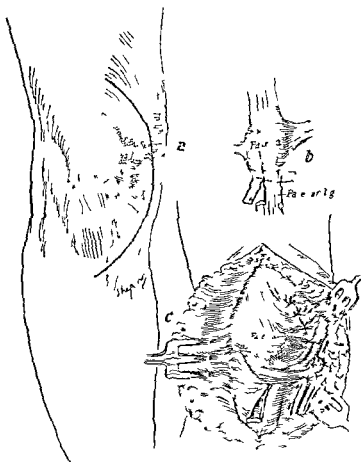


Fig. 97—*a*, Curved incision giving free approach to field of operation *b* patellar ligament split preparatory to transplantation of the insertion of its lateral half *c* wound ready for closure. Note transplanted portion of patellar tendon and plat on of medial portion of capsule of knee joint.

The dislocation of the patella is most frequently toward the outer side. According to one writer this is due to the fact that

the patella catches on the outer condyloid ridge and is then grooved over the ridge instead of into the trochlea or *facies patellaris*. There would seem to be some anatomic grounds for this in the fact that the outer portion of the trochlea is more prominent and extends higher than the inner portion. Dislocation of the patella is more common in women. But two cases of this kind have come to our attention and both of these were in women. In both women the inward inclination of the femur normally greater in the female than the male, was somewhat exaggerated giving a suggestion of *genu valgum*. Thus with the trochlear surface extending higher and more prominently on its lateral portion—a supracondylar ridge extending higher—we can conceive of a more ready displacement laterally, and with the greater inward femoral inclination a greater frequency in woman than in man.

Any method of fixation should aim to start the patella into the groove where it will continue its course. Hence a small force exerted high on the quadriceps tendon is quite as valuable as a more vigorous force exerted on the patella midway in its descent in the trochlea.

CLINIC OF DR THOMAS J WATKINS

ST LUKE'S HOSPITAL

A PLASTIC OPERATION FOR CONSTRICTION AT THE VAGINAL ORIFICE AND FOR VAGINISMUS

CONSTRICTION at the vaginal orifice is not a rare condition to encounter. Usually the treatment has not been very satisfactory. I employ a modified plastic procedure which Emmet devised for the relief of constrictions occurring in extensive vesicovaginal fistulae. The operation is also a modification of the procedure practised by T Gaylord Thomas for cure of constriction at the vaginal orifice.

TECHNIC

A median incision is made as shown in Fig 98 *a b* which should be long and deep enough to relieve all the constriction. *Care should be taken that no firm connective tissue fibers remain between the incision and the rectal wall.* Cutting through all this fibrous tissue means almost certainty of success in the relief of the condition and also permits satisfactory suture of the wound which could not otherwise be accomplished. The first suture is placed as shown in Fig 98 *c* and approximates the two ends of the incision. It is placed underneath the skin and mucous membrane. Two or three sutures are placed laterally which completes the closure of the wound and if accurately placed there is little or no raw surface left uncovered (Figs 98 *d* 99). The following case illustrates the use of the operation and its application.

Mrs D, aged twenty four, consulted me after she had been married six months. Her complaint was dyspareunia, profuse vaginal discharge with much irritation and sterility. There was no history of any venereal infection.

Examination revealed a profuse mucopurulent discharge with much redness of the vulva and vagina. Microscopic examination of the secretion showed an absence of gonococcus and an abundance of vaginal bacteria.

The operation described was performed with entire relief of the discharge and of the dyspareunia, and pregnancy took place some two or three months later.



Fig 99—Constriction of vaginal orifice Operation completed

I happened to encounter a number of these cases in the last two or three years where the above-described operation has given such satisfactory results as to induce me to present the subject today. A review of Emmet's work shows that he incised the connective-tissue bands for the relief of constrict

Fig 98—Constriction of vaginal orifice relieved by plastic operation
a b Location and depth of incision necessary to insure a successful result
c insertion of first stitch this stitch approximates the ends of the incision
d, closure completed by a few interrupted sutures



Fig 98

CARCINOMA OF THE CERVIX TREATED BY RADIUM AND HYSTERECTOMY

MRS T aged fifty three always well and strong until present illness Menopause one and a half years ago For one year has noticed a watery discharge at times occasionally streaked with blood but without odor

Examination revealed a carcinoma of the cervix making the cervix so large that it nearly filled the pelvis The vaginal walls however were very little involved Rectal examination revealed no induration in the broad ligaments

Diagnosis —Carcinoma of the cervix

The treatment decided upon was to use radium to be followed by hysterectomy and the postoperative use of radium To illustrate the extensive involvement of the tissues I refer to the fact that two of our best surgeons had decided the case inoperable

On May 19 1917 50 milligrams of radium were inserted and sutured in the cervical canal This was left in twenty four hours A section of the cervix taken for diagnostic purposes was proved to be a cancer Three days later a complete hysterectomy was made Cuffs of the vaginal walls were made and sutured over the cervix and the operation completed through an abdominal incision

Recovery was uneventful except for excessive vomiting during the second week after the operation There has been no evidence of any carcinoma about the stomach

Examination was made July 27 1917 and a small nodule was found in the vault of the vagina It was impossible to say whether this was carcinoma or scar tissue There was no erosion Rectal examination gave the same findings

On July 31 1917 50 milligrams of radium were placed in the vagina for twelve hours This was repeated on September 24 1918 and on December 23 1918

tions in extensive cases of vesicovaginal fistulæ. He observed that if these were incised the incision finally became circular. He later introduced sutures at the time of incision placing the sutures parallel to the line of excision. This same procedure was apparently independently developed many years later for the relief of stenosis at the pylorus of the stomach.

T. Gaylord Thomas treated this condition by making a deep longitudinal median incision and requiring the patient to wear a large Sims glass vaginal dilator for some weeks. He obtained excellent results, but the treatment was painful to the patient and the wound which had to heal by granulation persisted for a long time. The reports of other cases which I have treated for this condition are not necessary because they contain no features of additional interest. As far as my experience has extended I feel quite certain that this operation would also relieve all the cases of dyspareunia due to vaginismus.

CLINIC OF DR ARTHUR DEAN BEVAN

PRESBYTERIAN HOSPITAL

APPENDICITIS

Summary Historical review—the Ochsner treatment—advantages of operation in every acute case when the patient is a good surgical risk pathology of appendicitis—routes of infection—importance of local irritation of appendical mucosa diagnosis—three symptoms pain tenderness, and rigidity recurring appendicitis—cases of so-called chronic appendicitis without acute symptoms usually examples of mistaken diagnoses—fallacy of x ray evidence technic of appendectomy

Complications of appendicitis (a) abscess—locations—when to operate—general management—rupture into bladder—subphrenic abscess (b) liver infection—abscess and portal thrombophlebitis (c) general peritonitis—early diagnosis imperative—surgical treatment—anesthesia—incision—disposal of focus of infection—determination of extent of disease—irrigation of peritoneal cavity—drainage—dressings—after treatment

I WANT to present to you this morning 2 cases which we have clinically diagnosed as appendicitis, and to take the opportunity, with these examples before us to discuss pretty fully the ordinary clinical side of appendicitis. While the first case is being prepared and anesthetized for operation I will review briefly with you the history of appendicitis as we today recognize it, and the development of the surgical therapy for its relief.

I graduated in medicine in 1883, and up to that time the term "appendicitis" was practically not known in medical literature. The clinicians of that period, both the internists and the surgeons recognized a condition of perityphlitis, an inflammation about the ileocecal region resulting frequently in the development of a hard, inflammatory induration in the right lower quadrant of the abdomen, which in the majority of cases disappeared without operation, but which formed in the minor

COMMENTS

There has been no ulcerative area at any time since the operation. She still has a small mass at the former site of the cervix. This is now possibly 2 inches long and $\frac{1}{2}$ to 1 inch in the other diameters. The probabilities are that it is a carcinoma, and will ultimately become progressive. The patient has had no pain and there is no loss in weight.

The object in reporting this case is to show the good results obtained with radium and operation in bad cases and also to call attention to the use of radium before rather than immediately after operation for carcinoma. The interval between the use of radium and the operation is important. Numerous observations are recorded relative to the difficulty of the operation when considerable time intervenes between the radium application and the operation due to the production of an extensive amount of connective tissue. This is so marked that some authors advise not operating after the use of radium. We believe that if the operation is done after radium is used the interval should not be long enough for much connective-tissue formation to take place. It is likely safe however to have an interval of one month. The reason for not waiting in this case was the apparent rapid growth and for the mental effect upon the patient. From what we have observed in practice and gleaned from the literature we believe that there is danger in using an excessive amount of radium that an excessive amount of radium lessens the resistance of the tissues and produces a rapid growth of the carcinoma. In a case like this one treatment of 50 milligrams for twelve hours every two or three months should be considered the maximum dose. This case is an example of the great value of palliative remedies in the treatment of extensive cancer.

scuss cavity during the after treatment, or a sloughing mass, which might be the appendix itself. Frequently a fecal fistula would form and persist for ten days to two weeks, but these usually went on to closure without necessitating a second operation.

After Fitz's article, but especially after McBurney's first contribution, we at once here in America followed McBurney's example and attacked a number of these cases early with the intention of preventing, by removal of the appendix, abscess formation. In carrying out this work, however, we met with a great deal of opposition, especially from the medical men and also from a certain class of surgeons. From 1889 until 1900 a very heated debate went on here in America, and from America extended all over the world, in regard to the advisability of operating in the early stages of appendicitis, and the advocates of early radical surgery were very severely criticized. Naturally during this debate a great deal of evidence was submitted by both sides. In this decade at almost every meeting of the Surgical Section of the American Medical Association and of the American Surgical Association the subject of appendicitis and its treatment was discussed pro and con. The medical men and the conservative surgeons pointed to the fact that about 85 per cent of these cases went on to recovery without abscess formation and many of them took the position that only such as developed abscess should be operated upon. In the early history of the work many cases were operated upon on the third or fourth day or later when the patients were in desperate condition many of them with well-developed peritonitis and the mortality was very high. Gradually, however, as the evidence accumulated it became clear that if the cases were operated upon within the first twenty four hours of the onset and the appendix removed, that the operation was very safe and gave a low mortality, not to exceed 2 or 3 per cent, and this prompt surgery with removal of the appendix had the additional feature of relieving the patient permanently of the disease whereas the medical management was associated with a much larger mortality and had the disadvantage that in

ity of the cases an abscess which had to be opened and drained. The general conception was that the condition was due to an *impaction of feces in the cecum with resulting inflammation.*

It was not until 1885 when Reginald Fitz a pathologist and later professor of *internal medicine at Harvard University* presented his classical paper on appendicitis on the basis largely of deadhouse evidence that we began to realize the true pathology of the condition and learned that in almost all of these cases the appendix was the focus of the inflammatory process and it was not until 1889 that McBurney first attacked one of these cases surgically in its early development and removed the inflamed appendix before the process had extended beyond the appendix or had produced a localized abscess. I think we can very properly give Reginald Fitz the credit of establishing the etiology of the condition and McBurney the credit for the pioneer work in the *modern surgical therapy which has since that time been so generally adopted.*

I can probably present this subject in a clearer way to you if I relate my own personal experience as I lived through that developmental period of this work. In the first years that I was in practice from 1883 to 1889 the year of McBurney's first operation I operated upon a number of cases of appendicitis which however we regarded then as perityphlitis and did what was then the recognized surgical procedure. This was known as the *Willard Parker incision.* The Willard Parker incision was made parallel with Poupart's ligament and about 1 inch above it divided the skin and superficial fascia the external oblique and internal oblique and transversalis muscles and came down to the peritoneum. Then instead of opening the peritoneum as we do now in appendicitis operations the peritoneum was carefully lifted up from the iliac fossa until the surgeon's finger opened into the abscess in what we regarded as an extraperitoneal position which of course was not a fact but in such a way as to prevent opening the general peritoneal cavity. A drainage-tube was then introduced and the patient usually went on to a good recovery. Sometimes a fecal concretion would be washed out of the ab-

sequently, has resulted in a great deal of harm I take it that Ochsner's position, as far as the safety and desirability of immediate operation is concerned, is the same as that of most of our American surgeons, and that he would advocate this medical management only in the event that the patient could not be given the benefit of early radical surgical cure

My own position in regard to this question I want to make clear to you I am personally convinced absolutely of the great safety and importance of recognizing these cases of appendicitis early and doing immediate early operation, and I am convinced that this will save many lives and much suffering I frequently have made this remark in my clinic that in several thousand appendix cases that I have operated upon, I cannot remember of a single case that I regret having operated upon On the other hand, I remember dozens of cases which I did not operate upon that turned out badly and were sources of great regret I think my own experience is a fair test of that of the majority of surgeons The only proper place for the medical management of appendicitis that I can find is in handling cases which cannot be given the benefit of early surgical treatment, and in doubtful cases where we are uncertain as to our diagnosis and feel that the cases should be kept under observation for a longer or shorter period to determine the diagnosis During this waiting period rest and medical management should be instituted and is of definite value and in a third class of cases where, because of some serious organic lesion or old age, in weighing all the evidence we might properly come to the conclusion in that individual case that observation and medical management would be a safer procedure Where, however, the patient is a fair surgical risk, I have come to the conclusion that unless there are some such contraindications, no matter at what period during the acute attack of appendicitis the patient was brought to my service the better and safer plan was to remove the focus of infection as soon as possible

I would like to present to you my conception of the pathology of this condition We have to deal with an acute pus infection of the appendix How is this pus infection brought about? Is

a large proportion of the cases the patient had subsequent attacks

In spite of the bitter attacks made on the advocates of the early radical operation, the evidence soon accumulated, demonstrating beyond question the correctness of their views and this evidence has been accumulating ever since up to the present time, until we can now say that a case operated on within the first twenty four hours of the onset, with good technic, carries less than 2 per cent. risk to the individual. If not operated upon, the immediate risk is certainly four or five times as great and there is an additional risk of serious complications such as peritonitis, subphrenic abscess recurring attacks and permanent disability of the intestinal tract from adhesions etc.

Clear as these facts appear to us today, those of you who did not live through the period cannot realize what a difficult struggle it was to convince the medical profession and the public of the greater safety of prompt, early radical operation for the relief of the condition

During its development period Sahli, of Switzerland formulated the most rational form of medical management that was ever presented to the profession. Sahli's conception was briefly, this. That a patient attacked with appendicitis should be placed absolutely at rest the intestinal tract should be placed absolutely at rest with opium the vomiting and nausea which were such frequent accompaniments of the condition should be relieved by washing out the stomach no cathartics should be given and the patient should be given liquids and foods by rectum the whole purpose of the treatment being to produce absolute rest of the individual and rest of the alimentary tract, with the hope that this would bring about a localization and walling off of the inflammatory process limiting it to the appendix and the immediate neighborhood and the prevention of the development of peritonitis or other serious complications. This same treatment of Sahli's was emphasized and advocated in this country by Ochsner, and has been largely known as Ochsner's method of treatment. I think Ochsner's position has probably been very much misunderstood by some of the profession and con

that the inflammatory process begins almost always as a local condition due to abnormal anatomic conditions found in the diverticulum. I believe therefore that we should accept the idea of an acute inflammation of the appendix as being a local and not a hematogenous affair.

In regard to the organisms which are responsible for this condition—they are the colon bacillus streptococcus staphylococcus and pneumococcus. A good deal of work has been done for the purpose of demonstrating that anaerobic bacteria are the essential cause of the infection and that the pus germs are secondary invaders. Personally I do not believe that we have sufficient evidence on this point to accept this position and certainly for the time being it would be safer for us to accept as the active agents the germs which we constantly demonstrate as being present in these cases.

I would like to say a few words in regard to the diagnosis. To be of the greatest value the diagnosis should be made very early at a time in fact when we could not expect a completely developed symptom-complex that distinguishes the picture of appendicitis as described in our text books. In the first few hours of the attack it is as a rule possible to make a definite diagnosis on the basis of but three symptoms and these three symptoms are pain tenderness and muscular rigidity in the right lower quadrant of the abdomen. I have not infrequently operated upon a student who has walked in from the class-room or a nurse or an assistant who has met me at the hospital some morning with the statement that they have been suffering pain for several hours and on examination found a history of this pain definite tenderness over the appendix and rigid abdomen with however no vomiting and no increase in leukocyte count and no increase in pulse-rate or in temperature and have without any hesitation proceeded at once to the operation and removed an acutely inflamed appendix. May I not emphasize very strongly this fact that in the first few hours of the attack we have the very safest and best time to institute surgical therapy. *The diagnosis must be made upon these three pieces of evidence—pain tenderness and muscular rigidity.* I would like of

it through the circulation a hematogenous infection or is it an infection beginning in the mucosa of the cecum and of the appendix as a local process? The admirable work of Rosenow seems to show that the inflammation is hematogenic, reaching the appendix through the circulation. I recognize of course perfectly the fact that this is possible and that it does occur but to my mind of the cases that have actually occurred in our clinical experience the overwhelming majority were due to local inflammation and were not hematogenous. I want to present to you this line of reasoning in support of that position. In the first place a considerable proportion of these cases are associated with fecal concretions or foreign bodies in the appendix. To be sure fecal concretions are of themselves partly due to germ action but they are of slow development and an acute explosion resulting in the picture of an acute appendicitis from a foreign body or fecal concretion is to my mind clearly an infection beginning in the mucous membrane irritated by the presence of the concretion or foreign body and then extending to the other coats of the appendix. A local inflammatory process in the mucous membrane of the cecum is extremely common as can be demonstrated by postmortem evidence and the finding of scars of old inflammatory processes. Inflammatory processes involving an area in the cecum the size of a dime might give rise to no clinical symptoms whatever but the same size process involving the same amount of mucous membrane in the appendix would almost surely give rise to the picture of an acute appendical attack by interfering with the escape of the products of the inflammation from the appendix into the cecum.

Another piece of evidence that I would like to submit in favor of the inflammatory process being of local origin is the somewhat similar picture of diverticulitis either in Meckel's diverticulum or in a diverticulum associated with the sigmoid. Here we have anatomic conditions which favor the accumulation of fecal concretions retention of inflammatory products and the development of an acute inflammatory focus and I do not think that any one would claim that these cases of acute diverticulitis are hematogenous. I think we would all admit

us is the problem of recurring attacks of appendicitis in patients who come to us between attacks. Here I do not hesitate to remove the appendix provided the patient gives a perfectly clean cut description of the typical condition, and especially if I can obtain the evidence of the attending physician who took care of the patient during one or more attacks. We do, however, go over these cases very carefully and exclude any other possibility, such as kidney or ureteral stone, or gall stones, and naturally these operations for recurrent appendicitis form a large proportion of our cases.

There is one phase of this question that I should like to discuss with you, and that is the so-called cases of chronic appendicitis, those cases that have never had an acute attack but which are supposed to have a chronic infection in the appendix giving rise to slight distress in that region. I want to state my opinion on this subject very strongly, and it is that most of these cases are mistakes in diagnoses and not cases of appendicitis at all and personally, I do not recognize such a condition as chronic appendicitis which has never given rise to any acute symptoms. Almost invariably these cases are cases of colitis constipation associated often with the taking of cathartics, and clean up under medical management. Show me a clinic where any considerable proportion of the appendicitis operations are done for so called chronic appendicitis, and I will show you a clinic where a large amount of unnecessary operating is being done. In this connection too, I want to say a word in regard to the so-called x-ray diagnosis in cases of appendicitis. I personally place little confidence in x-ray diagnoses of these cases and where the individual has really had definite attacks of appendicitis, it is much safer to base the diagnosis on the clinical picture. Where the patient has symptoms of so called chronic appendicitis without ever having had an acute attack, I cannot believe that the x-ray evidence furnished is of any value. As I have already said almost all of these conditions are bowel affairs and clean up under proper management.

CASE I — The first case which we shall operate upon this morn

course, that the urine should be examined to eliminate a kidney or ureteral lesion, and if there is any possible reason to suspect such a source as the cause of the trouble an x ray picture and general vesical examination should be made to eliminate it. Especially should the chest be examined to eliminate any pneumonic process. Personally, I do not hesitate to urge operation on the basis of these symptoms alone. If, however, the patient is seen later, we may clearly expect to find an increased leukocyte count, slight elevation of temperature, and the vomiting which is so common may also have occurred. In making these early diagnoses of appendicitis in the first few hours one should be careful to try to eliminate the possibility of an intra intestinal affair, such as colitis. I am always suspicious of the correctness of the diagnosis of appendicitis if there is an associated diarrhea. Fortunately, almost invariably in these cases where the trouble is within the colon muscle rigidity is absent.

What shall we do with an appendicitis case that is brought to us not within the first twenty four hours but on the second, third, or fourth day? This is a problem that I have studied and worried over a great deal. I answer that now by saying with a good deal of confidence, that where I have the patient under my control and can give him the benefit of good surgery, I proceed at once to operate and remove the appendix, whether it be the second day, or the third day, or the fourth day or any day during the acute attack unless of course it is quite evident that he has practically recovered from that attack, in which event we might very properly wait for several weeks until the patient has recuperated. My position in this matter is that as long as the focus of infection is in the peritoneal cavity, it is a constant danger and a very probable source of general peritonitis and the sooner it is removed the better. If the case comes to us with a large appendical abscess we simply drain the abscess and advise a later appendectomy if the patient is in bad condition or if it is evident that the dissection necessary to remove the appendix in the presence of the abscess will add a definite and considerable danger.

One of the numerous problems that we have submitted to

simply passed through the aponeurosis (Fig 100 a) With retractors the incision in the external oblique is widely pulled apart exposing the internal oblique Now without any cutting I shall separate both the fibers of the internal oblique and the transversalis With two pairs of tissue forceps and with blunt dissection I spread the fibers apart for a distance of about $2\frac{1}{2}$ inches up to the rectus muscle in the midline and outward toward the superior spine (Fig 100 b) I want to emphasize the point that we do not use the knife in this separation and I want to emphasize another point that as you pass out toward the anterosuperior spine there is danger unless we are careful of injuring the circumflex iliac vessels If these are torn they should be clamped and ligated at once I like to operate on these cases with the help of two assistants I now introduce two more retractors and I use rather blunt retractors for this purpose so that I now have four retractors in the wound one assistant separating the external oblique with a pair of retractors and the other assistant separating the internal oblique and transversalis with the second pair This exposes the subperitoneal fat and the peritoneum for an area of about 2 inches square I now divide the subperitoneal fat and peritoneum in the same line that I have separated the internal oblique and transversalis (Fig 101 c) I want to call your attention to this fact because I believe it is a distinct improvement over the method formerly employed of making the division in the peritoneum parallel with the external incision It gives one more room in the manipulation and the closure of the peritoneum is easier I now open the peritoneal cavity and come down at once on the cecum but external to and below the cecum there is a dense mass of tissue which gave us the sensation of a tumor by external palpation I find that this is edematous omentum and as I carefully by blunt dissection separate this edematous omentum I come down to a large inflamed edematous appendix curled upon itself like a hairpin (Fig 101 d) Rather to my surprise I find no pus and the mass is composed entirely of edematous omentum and the hard inflamed appendix

You will notice that I do not pack in any gauze sponges in

ing is a man of about twenty-eight who presents the picture of a neglected and recent acute appendicitis. He has been ill for about ten days. After the first few days of his attack he returned to his work. He felt very badly but dragged himself about for three or four days. The pain and soreness then became so severe that he went to bed. Ice-bags were applied and the case was handled by rest, starvation and opium. Not improving he was brought to the hospital yesterday afternoon.

Examination shows a hard mass about the size of an egg in the region of the appendix. There is a good deal of tenderness, slight temperature and a leukocyte count of about 14,000. From the size of the mass I am inclined to regard it as a small walled-off abscess with rather thick walls. On the other hand it may be simply an inflamed appendix wrapped up in some edematous omentum. It is possible that if we simply watch this case the mass will gradually disappear and the man go on to recovery from this attack. On the other hand it is quite possible that a rupture of the abscess might occur and a general peritonitis develop and the man lose his life because of failure to receive proper surgical attention.

The patient is now anesthetized and I shall proceed to do the actual appendix operation which we employ in this clinic, and I ask you to follow me carefully as I describe the technique.

We make first an incision about 4 inches long the center of which is about at McBurney's point. McBurney's point as you know is on a line drawn from the antero-superior spine to the umbilicus and varying with the size of the patient from $1\frac{1}{2}$ to 2 inches internal to the anterosuperior spine. The incision is planned so as to be parallel with the fibers of the external oblique. I now divide through the skin and superficial fascia, and in doing this divide some small vessels in the superficial fascia which are clamped. Usually these do not require ligation but if they are of good size we ligate them at once. We now come down to the external oblique and I make an incision parallel with the fibers and this incision divides for about an inch the muscle tissue of the external oblique at the outer end of the incision, but for the greater part of the incision we have

simply passed through the aponeurosis (Fig 100 a) With retractors the incision in the external oblique is widely pulled apart, exposing the internal oblique. Now without any cutting I shall separate both the fibers of the internal oblique and the transversalis. With two pairs of tissue forceps and with blunt dissection I spread the fibers apart for a distance of about 2½ inches up to the rectus muscle in the midline and outward toward the superior spine (Fig 100 b). I want to emphasize the point that we do not use the knife in this separation and I want to emphasize another point that as you pass out toward the anterosuperior spine there is danger unless we are careful of injuring the circumflex iliac vessel. If these are torn they should be clamped and ligated at once. I like to operate on these cases with the help of two assistants. I now introduce two more retractors and I use rather blunt retractors for this purpose so that I now have four retractors in the wound one assistant separating the external oblique with a pair of retractors and the other assistant separating the internal oblique and transversalis with the second pair. This exposes the subperitoneal fat and the peritoneum for an area of about 2 inches square. I now divide the subperitoneal fat and peritoneum in the same line that I have separated the internal oblique and transversalis (Fig 101, c). I want to call your attention to this fact because I believe it is a distinct improvement over the method formerly employed of making the division in the peritoneum parallel with the external incision. It gives one more room in the manipulation and the closure of the peritoneum is easier. I now open the peritoneal cavity and come down at once on the cecum, but external to and below the cecum there is a dense mass of tissue, which gave us the sensation of a tumor by external palpation. I find that this is edematous omentum and as I carefully, by blunt dissection separate this edematous omentum I come down to a large inflamed edematous appendix curled upon itself like a harpin (Fig 101 d). Rather to my surprise I find no pus and the mass is composed entirely of edematous omentum and the hard inflamed appendix.

You will notice that I do not pack in any gauze sponges in



Fig 100—Muscle-splitting incision at McBurney's point (a) through skin and external oblique parallel to fibers of external oblique, (b) penetration of internal oblique and transversalis by blunt dissection

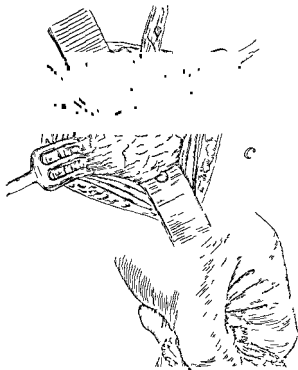


Fig 101 —c, Incision in peritoneum parallel to fibers of internal oblique, d, cecum drawn up, exposing base of appendix

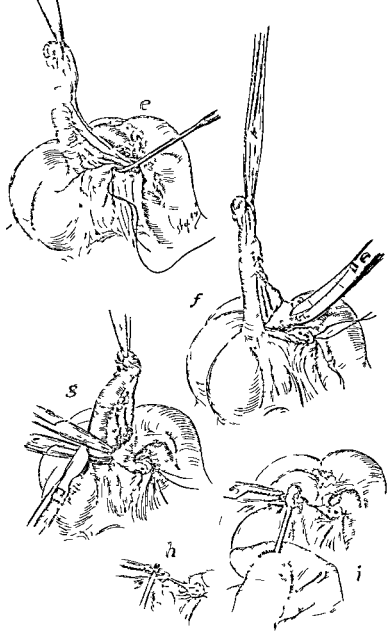


Fig 102

this case There was a time when surgeons were very fond of doing what they called "walling off" of an area like this, using a number of abdominal pads, and this was done with a great deal of care and it was thought to be very important For years now we have abandoned this walling off process unless it is definitely indicated by the presence of an abscess, and even where an abscess exists, if I can open it external to the cecum and can wall off the general peritoneal cavity from the abscess simply by using cecum itself for this purpose, I prefer to do that rather than to wall off with sponges or pads This appendix, as you see, is adherent to the mesenterium, and it requires a dissection with tissue forceps and scissors to free it so that we can bring the appendix and cecum well out of the wound You notice too that the mesenterium is very vascular, and that instead of requiring a single ligature, as is the rule it has been necessary for me to apply four ligatures in order to make sure of controlling the bleeding The mesenterium is now divided after we have ligated it, and this very long inflamed appendix is brought into view

The technic of removing the appendix and treating the stump which we follow is one which we have employed in at least 2000 cases and has given us very great satisfaction We have had one run of more than 1000 consecutive cases of interval operations for removal of the appendix without a death This, however, is not surprising as it has been equaled and surpassed in a number of clinics I of course, do not include in that statement removal of the appendix in the face of complications such as peritonitis I first clamp the appendix with a very heavy pair of forceps about $\frac{1}{2}$ inch from the cecum This heavy pair of forceps crushes the appendix at that point for the length of about $\frac{1}{4}$ inch to a mere ribbon I then put on a pair of forceps distal to this and cut off the appendix close to my clamp with a knife (Fig 102 g) The surface of the appendix I then touch with some pure carbolic acid using a sterile toothpick for this

Fig 102 — *e* Mesenterium ligated and cut *g* appendix clamped and cut *h* appendix stump carbolized *s* removing excess carbolic acid from stump following its application on toothpick

purpose (Fig. 102, *h*), and wipe off the excess of acid with some sterile cotton (Fig. 102, *i*). I now put in a purse-string suture about $\frac{1}{2}$ inch from base of the appendix in the wall of the cecum (Fig. 103, *j*). It is desirable where possible to take in at least $\frac{1}{2}$ inch of the cecum in this purse-string so as to make the subsequent invagination easy and closure complete. The first purse-string suture which I employ is of Pagenstecher linen and a non-absorbable suture. Now, grasping the cecum with a single layer of gauze between my thumb and finger close to the appendix, I remove the crushing clamp. You will notice that I do not ligate the appendix at all, but I pick up the ribbon-like crushed appendix with a pair of dissecting forceps without teeth and invaginate it into the cecum, and then tie my purse-string suture, completing the invagination (Fig. 103, *k*). Outside of this I now use another purse-string suture of fine catgut (Fig. 103, *l*). This, I think, is important. For a time we used a second purse-string suture of Pagenstecher linen, but I think in one or two cases it was responsible for a fistula that persisted for some time. This might be caused by a non-absorbable suture. My reason for not ligating the appendix is this, that there is distal to the point of ligation some material which must necessarily become necrotic, and I believe that it occasionally forms a focus for infection. The argument in favor of ligating the appendix is the argument supported by the surgeons who have had hemorrhage into the bowel following appendectomies where the appendix has not been ligated. I believe, however, that a careful study of the blood-supply of the appendix will show that if one can save a full $\frac{1}{2}$ inch of the appendix and crush it, that there is no risk of a hemorrhage into the caliber of the bowel, even though no ligature is employed. Then I want to submit the fact that in my own work covering several thousand appendectomies in the employment of this technic we have never had a single case of hemorrhage. If a ligature is employed, I think one should be careful to use a fine ligature, removing almost all of the tissue distal to it.

The cecum is now dropped back into the abdominal cavity and the wound closed. First, a fine catgut closes the peri-



Fig 103—Insertion of first purse-string of Pagenstecher linen, *A*, stump invaginated into cecum and purse string drawn taut. Note that stump of appendix has not been ligated, *B*, first purse-string tied and second, of catgut, in place.

toneum, and second a moderate sized catgut closes the transversalis and internal oblique. In employing this suture I want to caution you not to tie these sutures too tightly, simply approximate the muscle itself. It is not the purpose of the suture to strangle the muscle as one would do if he were ligating off a hemorrhoid but simply to approximate tissues. A medium fine catgut is now employed closing the external oblique and if the superficial fascia layer is thick as in a fat individual I close this by two or three fine catgut sutures separately. The integument is now closed with fine silk. You will notice that I have used here a very small cigarette drain simply passing down through the peritoneum into the cavity. I shall have this removed if there is no contraindication at the end of forty eight hours.

The second patient is a young soldier who has recently been discharged from the service. He gives a history of having had two rather sharp attacks of appendicitis in the last six months one about three weeks ago. The first attack was not clearly recognized as an appendix attack. During the second attack he was advised by the attending surgeon to have the appendix removed in the interval. He comes to us now with a pretty clean-cut typical picture of appendicitis and he describes his own case quite accurately. He emphasizes particularly the fact that for the first few hours after the pain began in the last attack the pain was diffuse but very soon localized itself over the right lower quadrant and that this for a time was exceedingly tender to touch and that it is still distinctly more tender than any other portion of the abdomen.

We have gone over the case carefully with the idea of excluding any other possibility. We have examined the urine carefully which was found negative and have taken x ray pictures of the kidney ureter and bladder to eliminate any possibility of kidney or ureteral stone. The x ray pictures were negative.

The patient is now anesthetized and we shall proceed to the operation. I follow exactly the same technic as in the first case. On opening the peritoneal cavity and drawing out the

cecum I find that there is no evidence of an abscess and very slight evidence of any local peritonitis, although the end of the appendix is wrapped around the mesenterium and bound in that position for about 1 inch. This, however, is rapidly separated and the appendix and mesenterium brought into view. The terminal end of the appendix is clubbed and distinctly larger than the rest of the structure and is very vascular, as though it had been the site of a recent inflammation. I remove the appendix in the same way as in the previous case. We shall not employ a drain in this case, but make a complete closure.

On splitting open the appendix I find, in the club-shaped end, two fecal concretions, one about the size of a bean and one about half that size. These are of the consistency of putty and are surrounded by a little mucus. The pathologic findings are perfectly in keeping with the short, sharp character of the attacks and with the persistent tenderness over the appendix.

I want to take this opportunity of discussing with you the most important side of this problem—that is, what might be called the complications, although, of course, they are the direct result of an acute appendicitis. Under this head I want to discuss the subject of appendical abscess and the subject of general peritonitis developing from an acute appendicitis.

Appendical abscesses today are not nearly as common as they were twenty years ago. Before 1889 all of our operations for what we know now as appendicitis were limited to the opening of appendical abscesses, and in the next decade until 1900 a large proportion of the appendix operations were done for appendical abscesses. Gradually, however, as we learned the importance of the early removal of an acutely inflamed appendix, and that by doing this we could prevent the formation of an abscess or a resulting peritonitis, surgeons more and more not only in this country but all over the world have operated so early that appendical abscesses are now the exception and not the rule, and occur for the most part necessarily in neglected cases. Appendical abscess in probably nine-tenths of the cases is in immediate contact with the appendix, and, therefore in the right lower quadrant of the abdomen, and for the most

part associated with a perforation of the appendix which has become walled off by a local plastic peritonitis, burying the inflamed focus within the wall formed by the omentum and the mesenteries and coils of intestine. The position of these abscesses radiate out like the spokes of a wheel from McBurney's point. In addition to this usual and what might be called normal position of appendical abscess there are other locations which should be noted and kept in mind. First, an abscess extending down into the pelvis in the culdesac, especially on the right side, and occupying in the male the space between the bladder and the rectum, and in the female the position between the uterus and the rectum. Another location is one passing up the inner side of the outer border of the ascending colon and if it is situated pretty well back it can simulate a per-

the pelvis pretty extensively and extending to the left side. There are, of course, cases with the unusual picture of transposition of the viscera with the appendix located on the left side. In addition to these, one of the most serious abscesses following appendicitis is the subphrenic abscess, usually located on the right side.

There was a time when surgeons debated the question as to when was the best time to operate on these abscesses and in Willard Parker's time, in 1870 and 1880, the rule was to wait at least a week, with the idea that after this period the abscess would become walled off and it could be operated on by the extraperitoneal route, and this idea had a pretty strong hold on many surgeons even during the period from 1890 to 1900 or even later. I believe, however, that this has been now almost entirely eliminated. My own view is that as soon as the diagnosis of abscess can be made, no matter where it is situated, effort should be made to handle it radically in a surgical way. Some years ago Morris Richardson, Professor of Surgery at Harvard, and a number of other surgeons advocated the handling of these cases of appendicitis associated with abscess in a two-

stage operation. They advocated first the drainage of the abscess and then later the removal of the appendix by a second operation after the patient had completely recovered from his acute attack. For a time this rule was pretty generally adopted. Then a good many surgeons, notably the late John B. Murphy, advocated removal of the appendix in practically all cases, even though it was associated with a large appendical abscess. I think I can express to you the position of the majority of surgeons now by saying this, that whenever in operating on a case of appendicitis associated with abscess the appendix can be removed without carrying marked risk to the patient, that this should be done at the primary operation, and, as a rule, this is possible. On the other hand, in the face of a large fecal abscess where removal of the appendix necessitates extensive trauma, carrying a definite risk to the patient, this should not be done at the primary operation, but the surgeon should satisfy himself in draining the abscess, leaving the removal of the appendix to a second operation. Of course this may not necessarily be required, as many cases of appendicitis associated with abscess have no attacks after their recovery from the operation for draining of the abscess. This was true in the case of the late King Edward of England, who was operated on by Treves, the man who contributed so much to the early development of appendicitis work in Great Britain. Treves simply drained in that case and there was no indication for further operation. Personally, I take this position in regard to these patients. Where I had not been able to remove the appendix or where I had been compelled to content myself with simply draining the abscess, I have advised the patient to later have the appendix removed at a second operation, I have found that so many of these cases have recurrences and sometimes serious complications that I believe this is sound advice.

In the operation for draining appendical abscesses the surgeon must be prepared for the occurrence of a fecal fistula after the drainage operation. This is usually temporary, however, and the patient usually recovers from the fistula without the necessity of any operation for the cure of that condition,

part associated with a perforation of the appendix which has become walled off by a local plastic peritonitis, burying the inflamed focus within the wall formed by the omentum and the mesenteries and coils of intestine. The position of these abscesses radiate out like the spokes of a wheel from McBurney's point. In addition to this usual and what might be called normal position of appendical abscess there are other locations which should be noted and kept in mind. First, an abscess extending down into the pelvis in the cul-de-sac, especially on the right side, and occupying in the male the space between the bladder and the rectum and in the female the position between the uterus and the rectum. Another location is one passing up the inner side of the outer border of the ascending colon, and if it is situated pretty well back it can simulate a perforation of the cecum. Occasionally the abscess extends into the pelvis pretty extensively and extending to the left side. There are of course, cases with the unusual picture of transposition of the viscera with the appendix located on the left side. In addition to these one of the most serious abscesses following appendicitis is the subphrenic abscess, usually located on the right side.

There was a time when surgeons debated the question as to when was the best time to operate on these abscesses and in Willard Parker's time in 1870 and 1880 the rule was to wait at least a week with the idea that after this period the abscess would become walled off and it could be operated on by the extraperitoneal route and this idea had a pretty strong hold on many surgeons even during the period from 1890 to 1900 or even later. I believe however that this has been now almost entirely eliminated. My own view is that as soon as the diagnosis of abscess can be made no matter where it is situated effort should be made to handle it radically in a surgical way. Some years ago Morris Richardson Professor of Surgery at Harvard and a number of other surgeons advocated the handling of these cases of appendicitis associated with abscess in a two-

stage operation. They advocated first the drainage of the abscess and then later the removal of the appendix by a second operation after the patient had completely recovered from his acute attack. For a time this rule was pretty generally adopted. Then a good many surgeons, notably the late John B. Murphy, advocated removal of the appendix in practically all cases, even though it was associated with a large appendical abscess. I think I can express to you the position of the majority of surgeons now by saying this, that whenever in operating on a case of appendicitis associated with abscess the appendix can be removed without carrying marked risk to the patient that this should be done at the primary operation, and, as a rule, this is possible. On the other hand, in the face of a large fecal abscess where removal of the appendix necessitates extensive trauma, carrying a definite risk to the patient this should not be done at the primary operation but the surgeon should satisfy himself in draining the abscess leaving the removal of the appendix to a second operation. Of course this may not necessarily be required as many cases of appendicitis associated with abscess have no attacks after their recovery from the operation for draining of the abscess. This was true in the case of the late King Edward of England who was operated on by Treves the man who contributed so much to the early development of appendicitis work in Great Britain. Treves simply drained in that case and there was no indication for further operation. Personally, I take this position in regard to these patients. Where I had not been able to remove the appendix or where I had been compelled to content myself with simply draining the abscess I have advised the patient to later have the appendix removed at a second operation. I have found that so many of these cases have recurrences and sometimes serious complications that I believe this is sound advice.

In the operation for draining appendical abscesses the surgeon must be prepared for the occurrence of a fecal fistula after the drainage operation. This is usually temporary, however, and the patient usually recovers from the fistula without the necessity of any operation for the cure of that condition,

although, of course, some of the fistulae are persistent especially those that are associated with a large perforation at the proximal end of the appendix near the cecum, or those that are associated with foreign bodies in the appendix

Large abscesses in the culdesac present an interesting problem I prefer to attack these from the usual appendix incision, though sometimes it is preferable to make a midline incision. Large appendical abscesses in the pelvis projecting into the rectum or into the vagina are cases in which the route of attack should be carefully studied out Often it is preferable to open these through the vagina or through the rectum rather than through the long tortuous route from above These cases usually do admirably, especially those opening into the vagina

One of the interesting problems in connection with appendical abscess on our service has been that of the abscesses which opened into the bladder We have had a number of these and some have been very difficult to recognize One patient that came under our observation about three years ago was admitted on the service of a colleague of mine with the diagnosis of prostatic abscess There was a discharge of very fecal pus into the bladder, and later the escape of pus and gas and feces from the urethra This was followed very promptly by an ascending nephritis from which the patient nearly lost his life, he had also marked symptoms of paralytic ileus The patient was referred to my service and his life was saved by promptly doing a colostomy on the left side This side tracking of the feces and washing out of the bladder enabled us to clean up the cystitis, and later I made a laparotomy and removed the appendix which was found down in the culdesac adherent to the bladder into which it had perforated At the time that I removed the appendix I explored the pelvis very carefully and could find no fistula leading into the bladder I subsequently operated on the colostomy and restored the continuity of the bowel This, however, was promptly followed by a recurrence of the old symptoms, gas and feces coming out of the urethra, and marked constitutional symptoms, necessitating my at once re-establishing the colostomy opening The patient has since

been in very good general health with the exception that he developed a bladder stone which was removed by suprapubic cystotomy, which failed to discharge any opening leading from the bladder into the bowel. He is now in very good general health and back at his highest employment. He returns, and I think very properly, any further surgical intervention.

One of the most trying problems in connection with acute appendicitis is the problem of subphrenic abscess and liver infection. I think clinically one can divide these into two groups, subphrenic abscess and septic thrombosis of the tail of the portal vein. We have had thirty or forty subphrenic abscesses on our service following appendicitis. The clinical picture is sometimes obscure and sometimes pretty definite. In the typical case there is usually an acute exacerbation of symptoms with chills, fever, pain in the right side, high up above the appendix region, increased liver dulness and distention in the area of normal respiratory sounds, and in many cases pushing of the liver downward below the costal arch and sometimes definite tenderness over the subphrenic area. One piece of evidence now at our disposal and which is of much value is a good x-ray picture showing the abnormally high stand of the diaphragm on this side. The diagnosis is usually made definite by the use of the aspirating needle locating the pus, and the pus can be evacuated, depending upon the situation either by an incision parallel and below the costal arch in front or by an incision in the lumbar region, or, what is more often necessary, by a transverse incision, or stilling depending upon the location of the abscess. The plethra, ninth, or tenth ribs, and reach up the subphrenic space transverse. This operation should be done, as a rule, under local anesthesia, and when the abscess is found, thorough drainage should be established. I think one of the criticisms that can properly be made on our handling of subphrenic abscesses up to this time has been that we have, as a rule, not provided sufficient drainage.

The cases of liver infection following appendicitis are of two general groups—namely, liver abscess, and the other, septic thrombosis of the portal vein or the tail of the portal vein. This

although of course some of the fistulæ are persistent especially those that are associated with a large perforation at the proximal end of the appendix near the cecum or those that are associated with foreign bodies in the appendix.

Large abscesses in the culdesac present an interesting problem. I prefer to attack these from the usual appendix incision, though sometimes it is preferable to make a midline incision. Large appendical abscesses in the pelvis projecting into the rectum or into the vagina are cases in which the route of attack should be carefully studied out. Often it is preferable to open these through the vagina or through the rectum rather than through the long tortuous route from above. These cases usually do admirably especially those opening into the vagina.

One of the interesting problems in connection with appendical abscess on our service has been that of the abscesses which opened into the bladder. We have had a number of these and some have been very difficult to recognize. One patient that came under our observation about three years ago was admitted on the service of a colleague of mine with the diagnosis of prostatic abscess. There was a discharge of very fecal pus into the bladder and later the escape of pus and gas and feces from the urethra. This was followed very promptly by an ascending nephritis from which the patient nearly lost his life. He had also marked symptoms of paralytic ileus. The patient was referred to my service and his life was saved by promptly doing a colostomy on the left side. This side tracking of the feces and washing out of the bladder enabled us to clean up the cystitis and later I made a laparotomy and removed the appendix which was found down in the culdesac adherent to the bladder into which it had perforated. At the time that I removed the appendix I explored the pelvis very carefully and could find no fistula leading into the bladder. I subsequently operated on the colostomy and restored the continuity of the bowel. This however was promptly followed by a recurrence of the old symptoms gas and feces coming out of the urethra and marked constitutional symptoms necessitating my at once re-establishing the colostomy opening. The patient has since

been in very good general health with the exception that he developed a bladder stone which was removed by suprapubic cystotomy, which failed to disclose any opening leading from the bladder into the bowel. He is now in very good general health and back at his original employment. He refuses, and I think very properly, any further surgical interference.

One of the most trying problems in connection with acute appendicitis is the problem of subphrenic abscess and liver infections. I think clinically one can divide these into two groups: subphrenic abscess and septic thrombus of the radicals of the portal vein. We have had thirty or forty subphrenic abscesses on our service following appendicitis. The clinical picture is sometimes obscure and sometimes pretty definite. In the typical case there is usually an acute exacerbation of symptoms with chills, fever, pain in the right side, high up above the appendix region, increased liver dulness and diminution in the area of normal respiratory sounds, and in many cases pushing of the liver downward below the costal arch and sometimes definite tenderness over the subphrenic area. One piece of evidence now at our disposal and which is of much value is a good x-ray picture showing the abnormally high stand of the diaphragm on this side. The diagnosis is usually made definite by the use of the aspirating needle locating the pus, and the pus can be evacuated depending upon the situation, either by an incision parallel and below the costal arch in front, or by an incision in the lumbar region, or, what is more often necessary, by a transthoracic incision resecting—depending upon the location of the abscess—the eighth, ninth, or tenth ribs and reaching the subphrenic space transthoracically. This operation should be done, as a rule, under local anesthesia, and when the abscess is found, thorough drainage should be established. I think one of the criticisms that can properly be made on our handling of subphrenic abscesses up to this time has been that we have, as a rule, not provided sufficient drainage.

The cases of liver infection following appendicitis are of two general groups: one, liver abscess, and the other, septic thrombus of the portal vein or the radicals of the portal vein. This

is a most serious complication and one that is usually fatal. Abscesses of the liver following appendicitis are usually multiple, and on that account are difficult to handle successfully surgically. The septic thrombus of the portal vein gives an almost absolutely hopeless picture. The symptom complex is that of a septic thrombophlebitis as far as the constitutional signs are concerned—chills and fever coming on every day or every other day. The subjective symptoms are those of slight jaundice, although this may sometimes be marked, and what is of most importance, the absence of other conditions that could account for the chills and the jaundice. Most of the cases of septic thrombus of the portal vein and multiple abscesses of the liver that we have had on our service following appendicitis have gone on to a fatal termination. There have been several peculiar exceptions to this rule which are hard to explain, where the picture seemed to be quite typical and the diagnosis quite definite, but after the condition had persisted for weeks, the chills and temperature gradually disappeared, the jaundice cleared up, and the patient went on to recovery.

But, after all, the most important complication of appendicitis is acute general peritonitis which if not relieved is so generally fatal. We have, of course, studied these cases on our service during the last twenty years with great interest, and have lived through the development of modern surgical therapy which has accomplished such wonderful results in the handling of the majority of these cases in the last twenty years. During that period we have learned to recognize general peritonitis and treat it, so that the mortality which a generation ago approached 90 per cent or more is reversed, and we are now able, under favorable conditions in the patients operated on early, to save 90 per cent.

I want briefly to outline to you our plan of handling acute perforative peritonitis cases. The diagnosis must be made within the first few hours certainly within the first twelve hours, if we are to hope for much from surgical intervention. This diagnosis must be made on a few data—pain, tenderness, and muscular rigidity. We cannot afford to wait for a high leukocyte

count, for a marked increased in temperature, for a tympanitic abdomen, or the thready pulse and dusky face of dying peritonitis. If the patient is to be saved the operation must be performed because he has pain, tenderness and a rigid belly. One must not wait for tympany and thready pulse, which are often not signs of the disease alone, but signs of impending death. In discussing the modern surgical management of peritonitis and attempting to estimate its value we must assume that we have made a moderately early diagnosis and that surgical interference is undertaken within a reasonable period after the onset of the peritonitis. I should like to discuss the scheme of surgical management under several heads viz (1) anesthesia, (2) incision (3) proper surgical disposal of the perforation or focus of infection (4) testing the peritoneal cavity to determine if the peritonitis is local or general, (5) when there is free pus or noxious material in the general cavity, its removal by irrigation with normal salt solution, (6) drainage, (7) surgical dressing (8) after treatment—the modified Fowler position, (9) intermittent salt solution per rectum (10) washing out the stomach, (11) question of medication morphin and strychnin (12) water and food by stomach, (13) paralytic ileus and the saline cathartic treatment.

1 *Anesthesia*—The normal anesthetic in these cases is drop-ether, properly given. In cases in which the patient is in very bad condition and the operation short, nitrous oxid gas may be employed unless there is a heart lesion and then ether is safer.

2 *Incision*—The first incision should be made over the suspected focus. As a muscle-splitting incision for an appendix case or a median line incision above the umbilicus for a stomach or duodenal case.

3 *Perforation*—The perforation or leak must be so handled as absolutely to prevent any further leakage. I would be very insistent on this point. I have too often seen cases in which the peritoneal cavity was simply opened and drained without closing the leak permanently, and in which the patient was almost certainly lost because the leak continued. The teaching

that if it is difficult and time-consuming the leak should not be sought for and closed is bad teaching I should say that it is so important for the safety of our patient to close every leak or perforation of the alimentary canal causing peritonitis that a most thorough closure should be obtained even at the cost of some risk and time It is only in extremely difficult cases with patients in such bad condition that they will evidently stand nothing in the way of operative interference except an incision and the introduction of a drain that we should make an exception to the rule In cases of peritonitis from suppurative foci other than the alimentary canal as the uterine appendages it is desirable to remove the focus entire if the condition of the patient permits if the patient's condition is bad we can trust to drainage alone with somewhat better chances than in the cases with alimentary canal perforation

4 *Testing the Peritoneal Cavity to Determine Whether the Peritonitis is Local or General*—This to my mind is one of the most important and interesting developments in the modern technic As an illustration let me cite 2 cases of appendicitis.

CASE I.—A young man of twenty was brought into the hospital with a diagnosis of appendicitis He had been ill several days from the history a perforation had occurred a few hours before I operated at once and found a perforated appendix with free pus about it This was removed and the stump invaginated into the cecum I then took a female glass catheter and tested the abdominal cavity I placed my thumb over the open end introduced the point into the culdesac removed my thumb for an instant and then replaced it and withdrew the catheter employing it in much the same way that one does a glass pipet in picking up urine from a bottle As I withdrew the catheter I found the lower 5 or 6 inches full of creamy pus I then knew that I had a free general peritonitis to deal with and handled it accordingly

CASE II.—A boy of ten gave much the same history I operated on him in the same way and when I tested his culdesac found nothing in the catheter except a small amount of clear peritoneal fluid and I therefore handled this case as one

which was still limited to the region about the cecum although the pus was free in that part of the peritoneal cavity

5 *Pus in the General Peritoneal Cavity*—When there is free pus or other noxious material widely disseminated in the peritoneal cavity I believe that it should be removed by irrigation. No one would doubt the advisability of washing gross stomach contents out of the peritoneal cavity in a case of perforating ulcer of the stomach why should we not do the same for fecal pus or any pus?

When I have tested the peritoneal cavity with a glass catheter in the way I have described and found free pus I then make a small buttonhole counteropening in the median line just above the symphysis through this a large glass tube is carried to the bottom of the culdesac then through the main incision whether for appendix or stomach another similar tube is carried to the seat of the perforation or focus and this is attached by a rubber tube to an irrigator filled with normal salt solution at 112° F and the peritoneal cavity is flushed out with several quarts of this irrigating fluid until the fluid comes out perfectly clear. Practically no time is lost in this part of the operation as we are closing the main incision while the water is running.

6 *Drainage*—Rubber tubes should never be used in these cases for drainage at least unprotected rubber tubes. Cigarette drains are much to be preferred. A long cigarette drain made of a small rubber tube about as large as a No. 10 or 12 catheter about which gauze and gutta serena tissue is wrapped until it is the diameter of a lead pencil or little finger is carried through the small buttonhole in the median line to the bottom of the culdesac. Similar drains are carried to the point of closure of the perforation or removal of the inflammatory focus and the rest of the main wound is closed.

7 *Dressing*—The surgical dressing should be a copious moist hot wet dressing of hot boric solution. A moist dressing picks up the discharge better than a dry dressing. These dressings should be changed every six to twelve hours as demanded by the amount of discharge—usually twelve hours is often enough sometimes twenty four.

8 *Position* —The Fowler position is of much value for these patients but unfortunately an exaggerated position has often been insisted on to the great discomfort and disadvantage of the patient. I am sure that we have obtained all the possible benefits of the position by allowing the patient to lie flat in bed and elevating the head of the bed from 18 to 20 inches on two chairs. In order to prevent the patient from sliding down in bed a bolster is placed below the buttocks and held fixed to the head of the bed by strips of roller bandage. I should like to emphasize the importance of this method of using the Fowler position. I have seen patients positively tortured by being compelled to sit up in bed because the attending surgeon has been led to believe that this position was indispensable to the modern method of treating peritonitis.

9 *Saline* —I think that we are all agreed that furnishing these patients with a large amount of fluid by the bowel is one of the important factors in securing for us our improved results. This matter has however been greatly overdone. Continuous irrigation by complicated apparatus is often insisted on much to the unnecessary discomfort of the patient. The presence of a tube constantly in the rectum is annoying. What we desire to accomplish is to furnish the patient a large amount of water so that the kidneys can act well and excrete the toxins and so that the system will have enough fluids for the comfort of the patient. This can be done by interrupted rectal irrigation with much greater comfort to the patient and with all the benefits that can be obtained from the continuous irrigation. The continuous irrigation if pushed may be a positive danger sometimes producing edema of the lungs and of the extremities. The rule is to give from 8 to 16 ounces of normal salt solution every two to four hours to be retained and a cleansing enema once or twice a day.

10 *Stomach Washing* —If the patient vomits repeatedly the stomach should be washed out. I do not believe however in making gastric lavage the rule. If the vomiting persists the lavage should be repeated. Great care should be taken to prevent if possible the development of acute dilatation of the

stomach, a condition very similar to paralytic ileus. If the patient does not vomit or if the vomiting is slight and soon ceases, the patient should be given water by the mouth, at first in small amounts, and as the conditions improve, this can be increased, with a corresponding decrease in the amount given per rectum. If at the end of twenty four hours after the operation the general condition is good, milk and Vichy in small amounts—an ounce each—every hour, can be begun.

11 *The Question of Medication*—Morphin should, as a rule, be withheld, and still, in a large minority of cases when the pain and restlessness are great, it is often of great benefit giving the patient sleep better respiratory action and increasing his chances of recovery.

12 *Ileus*—Paralytic ileus is sometimes a serious or even fatal complication. It is here that proper early use of saline cathartics has been of value. Most patients have more or less gas pains. These should be handled by stimulating injections given low in the rectum, I usually use magnesium sulphate and glycerin and water in equal parts. Where the distention is considerable and persistent saline cathartics in small repeated doses with stimulating enemas and strychnin in moderate doses should be employed. In a few cases secondary operations for localized abscesses will be necessary, and in a few cases in which the ileus persists enterotomy will be required.

I have found that one of the most valuable means of combating paralytic ileus is castor oil in small and repeated doses. I usually give a teaspoonful every hour until peristalsis with expulsion of gas and feces is secured.

I believe that, following out this general scheme we can, in cases early diagnosed and early operated on succeed in saving a very large percentage of our cases of general peritonitis. And when our laboratory colleagues ask us what clinical surgery has done we can tell them that for one thing it has solved the problem of peritonitis, that under favorable conditions it can save 90 per cent of these patients who but a few years ago were almost certainly doomed to die.

APPENDICAL ABSCESS AND CARCINOMA OF THE CECUM

Summary Case I—A patient seventy years of age with a movable mass in the right lower quadrant of the abdomen diagnosis appendical abscess discovered at operation

Case II—A patient of sixty with a movable mass in right lower quadrant of abdomen diagnosis resection of carcinoma with lateral anastomosis of bowel—technic

APPENDICAL ABSCESS

THE first patient on whom I shall operate today is one that gives a rather confusing clinical picture. It is an old lady of seventy, who came to me with the statement that six weeks ago she rather suddenly developed a pain in the right lower quadrant of the abdomen associated with some temperature, some vomiting and marked constipation, and a good deal of tympany. At the end of about three days the symptoms subsided, and with enemas and laxatives she succeeded in getting her bowels to move and gradually recovered from the condition so that within another week felt quite well again. Ten days ago she had a similar experience from which she has recovered as far as any acute symptoms are concerned and she comes to us this morning in fairly good condition. Her pulse and temperature are normal there is no bloating of the abdomen her bowels moved yesterday and the day before she has not vomited. She has however some pain or, rather a sense of uneasiness in the right lower quadrant of the abdomen and some tenderness on pressure and as I examine her I find a movable mass about the size of a lemon in the region of the cecum. It is moderately tender, not exquisitely so and I confess that I am uncertain whether we have to deal with a carcinoma of the bowel or a walled-off appendical abscess which is so situated in connection with the cecum, the ileum, and omentum as to permit of a considerable degree of mobility. We have been confronted a number of times with just the same clinical picture, and in

some of the cases we have found that we had to deal with a walled-off abscess and in others we have found unfortunately that the mass was a carcinoma of the cecum and in still others especially in young individuals we have found that we had to deal with an ileocecal tuberculosis. I am glad of the opportunity of showing you this problem because it is confusing and one must be prepared to find one of several different pathologic conditions responsible for the condition.

The patient is now anesthetized and I shall make the usual muscle-splitting incision that we make for an appendicitis case. Opening the peritoneal cavity I come down to the cecum and I find a movable tumor between the cecum the ileum and the omentum. It looks as though we had to deal with a neoplasm but as I carefully peel off the adherent omentum you will see in there a small abscess cavity filled with thick yellow pus and as I empty it out you will see that there is altogether probably 2 ounces of pus in this cavity. I cannot as yet see the appendix but following the longitudinal band of the cecum downward and continuing my separation I now bring the appendix into view and find that there has been a perforation on the side of this short thick walled appendix communicating with the abscess cavity. I separate the appendix with a good deal of difficulty from the surrounding adhesions ligating off the mesenterium. I invaginate the stump into the cecum with purse-string sutures removing all the pus which has a slight colon odor carefully with moist sponges. It will of course be desirable to drain this cavity for some days and I shall do so with a small cigarette drain which has a rubber tube of good-sized caliber in the center and close the incision in the usual way.

After history —The patient went on to a quite uneventful recovery. There was some suppuration from the abscess for three or four days the colon odor disappeared and at the end of about three days the cigarette drain was removed and a No 12 American soft catheter was introduced in its place. The discharge continued slight in amount for another week and the catheter was gradually shortened and at the end of ten days was removed entirely.

CARCINOMA OF THE CECUM

I am fortunate to be able to show you this morning another case which presents somewhat the same clinical picture as the one we have just operated upon and yet in this particular case I think we are in a position to make a very definite diagnosis. This patient is a woman of sixty two. She comes to us with the history of a gradually developing and rather marked constipation. She makes the statement that on four or five occasions she has had great difficulty in getting the bowels to move but that finally with oil and enemas a bowel movement could be obtained and then for a period of two or three days she would have more or less diarrhea. She has lost some weight and strength although her general condition is good. As far as she knows she has had no temperature or chill or any evidence of constitutional infection. She has never noticed any gross blood in the bowel movements. She states that she has discovered a mass quite movable in the right lower quadrant of the abdomen.

She has been on my service for several days and we have made a complete and exhaustive examination of the case. We find that as we examine this mass it is quite movable and seems to be about the size of my fist and situated in the position of the cecum. Examination of the feces shows a constant positive Weber showing the presence of blood. An examination with a barium injection into the large intestine shows a definite filling defect which you will see in the x-ray picture. I have no hesitation in making in this case a definite clinical diagnosis of carcinoma of the cecum. She has no evidence of a general carcinomatosis. Her general condition is excellent and we shall attempt to do here a radical operation resecting the cancer and I am hopeful that there has as yet been no regional or general involvement and that the prospects of cure if she recovers from the operation are excellent.

Under ether anesthesia I make a very large muscle-splitting incision the same that we use for an appendix operation. You will notice however that the incision is 7 or 8 inches in length and that as I divide the external oblique I expose the internal

oblique from the anterosuperior spine to the outer border of the rectus muscle. I separate the internal oblique and transversalis parallel with their fibers by blunt dissection and this gives me a very large opening into the peritoneal cavity. I now come down to a large tumor perfectly free. The omentum is not adherent to it. There is no evidence of inflammation or local peritonitis. There is, however, as I examine it a direct extension from the tumor of the cecum to the parietal peritoneum on the outer surface of the tumor, so that it will be necessary for me to excise an area about the size of a silver dollar of the parietal peritoneum which has grown to the tumor. I now examine the mesenteric glands and find they are not enlarged. There are no deposits in the liver. The carcinoma seems to be limited to the primary focus and I shall therefore proceed to the resection. I shall do this in preference to the Mikulicz method of bringing out the tumor mass, sewing it outside of the wound and later removing it and still later curing the fistulæ by a plastic. The Mikulicz is sometimes necessary but I prefer resection and lateral anastomosis when ever possible.

The first step in this operation is to divide the outer layer of the mesocecum and the mesocolon of the ascending colon. This outer layer is not vascular, and I divide it from the iliac fossa up to the hepatic flexure. As I do this I notice that there are some adhesions about the hepatic flexure and my assistant reminds me of the fact that several years ago this woman was operated on for gall-stones, and these adhesions are due to that operation. I now bring the tumor out into the wound and the entire ascending colon and 5 or 6 inches of the terminal ileum. The next step will be to ligate off the mesentery of the cecum and that part of the ileum and that part of the ascending colon that we shall remove in the operation. Thus you see I can do with one large catgut ligature ligating the vessels deep down at the root of the mesentery. I now divide the mesentery above the ligature and proceed to clamp off the ileum about 2 inches from the ileocecal valve and the ascending colon about 2 inches above the carcinoma. I use very heavy massive clamps for this

purpose After leaving the clamp on for a moment I now ligate, with a strong silk ligature, first the ileum at the point where I have crushed it with clamps and second, the ascending colon where I have crushed it Now, putting on two other clamps close to the point of ligation so as not to allow the escape of any fecal contents from the section we are to remove, I divide the bowel at each side close to the point of ligation and remove it

The next step is the invagination of the end of the ileum and of the end of the ascending colon I do this with purse-string suture, putting the first purse string about $\frac{3}{4}$ inch back from the point of ligation and the second purse string over this, taking in about another $\frac{1}{2}$ inch of the bowel so as to make a very complete invagination I have used in these purse string sutures Pagenstecher linen I now make a lateral anastomosis between the terminal ileum and the ascending colon, doing this just as we do a gastro enterostomy, using three rows of sutures and selecting by preference for the anastomosis in the colon the longitudinal band of fibers because the bowel wall is stronger at this particular point and the suturing is easier and safer, selecting for the anastomosis of the ileum a point directly opposite the mesentery You will notice that I do not make a very large opening An opening 1 or $1\frac{1}{4}$ inches in length is quite sufficient because the contents of the ileum passing through the opening into the cecum are liquid, and an opening of this size is quite as large if not larger than the normal ileo cecal valve

There remains for us now the closure of the opening in the mesentery This is quite important, because if we allowed this opening to remain at the point of resection, a loop of intestine might pass through it and become strangulated, and we might lose our patient from mechanical ileus as a result I therefore very carefully with fine catgut close this opening in the mesentery I now proceed to close the external wound just as we do an appendix wound I shall, however employ drainage in this case I always do in these excisions of the bowel, believing that it is distinctly safer For this purpose I use a small cigarette drain and carry it down to the point of anastomosis

The pads and sponges are accounted for and the patient is in excellent general condition. I think that the chances are about 80 to 85 per cent. that she will recover from this operation, and the prospects of permanent cure I should think would be 40 or 50 per cent, judging from our experience in these cases where we have been able to resect the carcinoma of the colon before there has been any regional or general involvement. I want, however, to change that statement somewhat, because for the moment I forgot the fact that this carcinoma had already invaded the parietal peritoneum. You will remember that we had to resect a part of the parietal peritoneum, and I think on that account we should modify our statement and say that probably the prognosis as to permanent cure would be 20 to 25 per cent in this case.

I am very glad of the opportunity of showing you at this clinic these 2 cases so much alike as far as physical findings were concerned, and in a general way the clinical picture, and yet so different in pathology, one an appendical abscess and the other a carcinoma of the cecum. I would like to refer to another group of cases with which we have had considerable experience and in which the clinical picture is very much the same as in these two cases, and in which we have a combination of the two pathologic conditions, and that is the rather rare condition of a carcinoma of the appendix, which becomes the site of an acute appendicitis. I can do nothing further today than simply refer to this condition. It is one about which a great deal of surgical literature has now accumulated. The usual picture of

it is one about which a great deal of surgical literature has now accumulated

that

finds

at the time of operation what appears like an acutely inflamed appendix containing pus but usually with very thick walls. The majority of these carcinomas of the appendix that I have operated upon that have been acutely inflamed have been suspiciously large appendices. I would like to impress upon you the importance of very careful histologic examination of specimens of this kind that you remove so as to determine at once

whether you have to deal with simply an inflammatory lesion or whether you have to deal with a combination of a neoplasm and an inflammatory lesion in the same appendix

Of course, the problem naturally presents itself to one's mind that there may be some other pathologic explanation for the greatly thickened appendix, such as tuberculosis or actinomycosis. At any rate whenever at an appendix operation there is induration or marked thickening of the appendix at any point, the surgeon should realize the possibilities in that case of carcinoma, tuberculosis, or actinomycosis and should make a careful histologic study to determine the existence of such a complication, and this should be done at once, so that the patient may be given the benefit of a later secondary operation after the subsidence of the acute symptoms if it is thought that such secondary operation might enhance the prospect of permanent cure

After-history—The patient had a slight temperature on the second and third day up to 100.8° F. On the third day the cigarette drain was removed and a slight amount of pus with a distinctly fecal or, rather, colon odor made its appearance. A No. 12 catheter was introduced in place of the cigarette drain. The colon pus continued to discharge for about ten days. There never was at any time any fecal matter, showing evidence of a leak in the bowel. By the fourth day the patient's temperature was normal and she was able to take a soft diet. In spite of the discharge of colon pus about the drainage tube the rest of the wound healed up very kindly and without any infection. The patient had no vomiting and rather free bowel movements—three or four times a day—liquid bowel movements beginning about the third day after operation. The patient went on to a complete operative recovery.

AMPUTATION AT MIDDLE OF THIGH FOR GAS GANGRENE

Summary Gangrene of the leg following injury to popliteal vessels by charge from shotgun technic of amputation in presence of gas gangrene—the guillotine method superseded—general management—importance of the early treatment of wounds—debridement

January 15, 1919

I WANT to present to you this morning a case that is a rather unusual one in civil practice, but is one that has been met with thousands of times on the Western front during this war. The case, in fact, is identical with many extensive shell injuries of the lower extremities which have been of necessity badly handled in military surgery in many instances because of the impossibility of transporting the patient at once to a hospital where he could receive proper surgical attention.

This boy is only fourteen years of age. Six days ago he was out rabbit shooting and very thoughtlessly and carelessly poked the butt of the shotgun into a corn shock into which he had seen a rabbit run. As he did this the hammer of the gun caught in one of the corn shocks and was pulled partially back and then drove the firing pin with sufficient force to explode the shell. The shotgun was an ordinary single barrel gun loaded with $1\frac{1}{4}$ ounces of light shot. The barrel of the gun was in close contact with his knee and the discharge tore out the structures in the popliteal space back of the joint, evidently injuring the vein and artery. The attending physician who was called was in hopes that he could save the limb. It was put up in an anti-septic dressing. It was noticed however after the accident that the leg became cold and then black and gangrenous up to the knee-joint. This morning he was brought by ambulance to my hospital service.

You will see that there is gangrene of the leg up to the knee-joint, and above that point the lower half of the thigh is quite swollen and edematous and on palpation I find that it crackles.

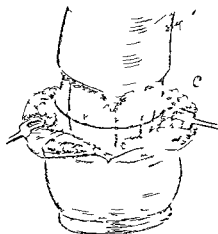
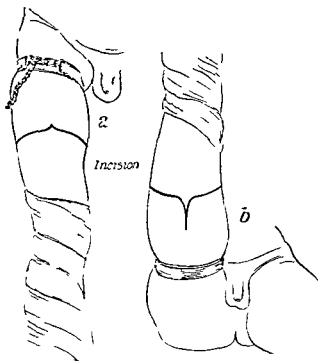


Fig 104

showing that there is gas infiltrating the tissues. It is clearly a case of gangrene from cutting off of the blood supply, followed by a gas bacillus infection. The boy's general condition is very bad. His temperature is 104° F and his pulse is very weak. He is dozey and it is very questionable whether we can save his life. I have told his father that the chances are about three to one against him, but that the only chance for him is to make an immediate amputation.

The boy is now anesthetized with drop ether. The dead limb is covered with sterile cotton and a gauze roller, and the entire thigh and buttocks and well above Poupart's ligament is cleaned up with tincture of green soap and alcohol. I now apply an Esmarch bandage as high up the thigh as I can, controlling the circulation so as to make the amputation bloodless, and have the boy lose as little blood as possible during the procedure. The gas gangrene extends up on the outer side of the thigh over the buttock but not on the inner side. It is evident that I cannot make the amputation entirely above the infected tissue and it will be necessary for me to divide the tissue that is already infected by the gas bacillus. I shall make the amputation through the middle of the thigh and I shall do what I do by choice in these cases, a bilateral flap, making an internal and external flap because in this way we can secure better drainage. I make what has been termed a "racquet incision" in making this bilateral flap. Beginning in the midline in front I cut through the skin and superficial fascia and then carry the incision posteriorly in the midline 2 or 3 inches higher than I did anteriorly (Fig 104, a, b). I retract the skin and superficial fascia for a distance of about 2 inches, and then, as you see, divide the muscles of the thigh transversely at this high point (Fig 104, c). Here in making the internal flap I come down to the femoral artery and vein which do not bleed on account of the Esmarch bandage. I immediately clamp these with forceps and ligate them and, as you see, I put on a second ligature

Fig 104—*a, b* Esmarch bandage in place racquet incision outlined *c*, skin flaps reflected location for incision through muscles denoted by heavy black line

for additional safety I want to make the amputation as rapidly as I can and shall not make an effort to do what I should prefer doing in this case, making an aperiosteal division of the bone but shall simply divide the bone transversely with the saw, in order to save time, at a level a little higher than that at which the muscles are divided (Fig 105, *d*) You will notice, on the posterior and outer side of the limb, a marked edema from the gas bacillus infection which involves the superficial fascia at the point where we have made the amputation The muscles themselves and the intramuscular layer seem to be pretty clean and normal. I pick up the sciatic nerve, draw it out, and cut off about an inch of it in order to make sure that it is not involved in the gross scar (Fig 105, *e*) I pick up in close contact with the sciatic nerve, the sciatic vessels and ligate them I find in close contact, too with the femoral vessels some other vessels of fair size which are evidently bifurcating branches from the profunda These I also pick up and doubly ligate, and as I look over the field I find four or five oozing points on which I apply artery forceps Now I put a very hot gauze compress over the stump and ask one of my assistants to make some pres-

seized with artery forceps and ligated The hemorrhage is now completely controlled

The problem that confronts us now is that of securing very excellent drainage and at the same time attempting to secure a good stump after wound healing is complete I wish you would follow me now in the technic which I shall attempt in this case and which I think is a much better plan than the guillotine amputation which was for a time strongly advocated by military surgeons during this war but which has now been pretty generally discarded

I take a broad strip of iodoform gauze about 5 inches wide and double it once and cover the entire surface, muscles bone and all, with this gauze bringing it out at the upper angle and at the lower angle of the incision I now close the line of the

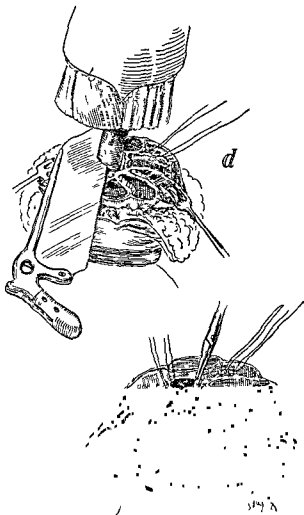


Fig 105—d, Incision through muscles completed, soft tissues retracted, with limb at the perpendicular, and bone being cut through, e, amputation completed, large vessels have been secured and the sciatic nerve has been drawn down preparatory to being cut off short

incision over this gauze with silkworm-gut sutures, placing them about an inch apart. These sutures pass through the

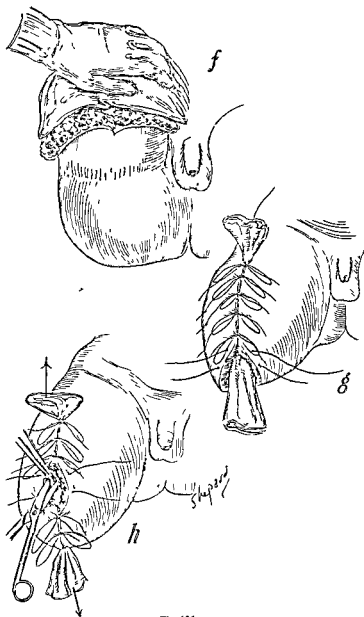


Fig 106

skin, superficial and deep fascia. I now tie these sutures not in a hard knot, but in a bow knot so that I can rapidly untie them and use them as secondary sutures. We secure, as you see, very good approximation of the line of incision. I shall apply over this a moist boric dressing and a large absorbent dressing over that (Fig 106, g).

The boy is in very bad general condition and will be treated as a shock case as far as we think this can safely be done. I would not advocate intravenous or subcutaneous transfusion in this case but will place the patient in bed with the head well lowered and give him salt solution by the rectum. As we complete the operation I want to repeat to you what I told his father, that the chances are probably three to one against the boy's surviving the injury and the operation necessary for the removal of the gangrenous limb. Although we have removed the greater part of the tissues infected with the gas bacillus there is still some remaining and unless the boy has enough resistance to overcome the gas bacillus infection still remaining in his tissues he of course will succumb to the lesion.

AFTER HISTORY

The boy had a great deal of shock from the amputation. The following morning he was very much brighter and in very much better condition and was able to take liquid nourishment without vomiting and retained the normal salt solution per rectum very well. He still had a temperature in the evening of about 102° F for several days, but dropping to normal in the morning. It gradually disappeared so that at the end of the fourth or fifth day the temperature was normal. At the end

Fig 106—f A hot pad is placed over the stump as the Esmarch is removed bleeding points are grasped with forceps and ligated as the pack is

a . . .
 b . . .
 F . . .
 w . . .
 w . . . pulled out through each end of the incision. The sutures were then retied

of the fourth day the boy was sent to the dressing room. Two of the central silkworm-gut stitches that had been tied with the bow knot were untied and the large layer of iodoform gauze that covered the entire stump was divided in the middle and then thoroughly soaked for ten or fifteen minutes with peroxid solution 1 part to 4 parts of sterile water. At the end of that time the gauze was very carefully removed with very little bleeding and the silkworm guts were tied fairly snugly securing a very good approximation (Fig 106 h). Within thirty-six hours after the amputation all signs of crepitation had disappeared and the boy seems to be going on to a very good recovery and with the prospects of a very good stump.

The case is illuminating from several standpoints. First, that the same sort of gas bacillus infection that has been so common on the Western battle front may occur in any individual on the streets of Chicago or in any village throughout the country provided the factors essential to produce these conditions are present. In other words there is nothing peculiar about the soil of Belgium or northern France as has been stated by some military authors which makes these extensive gas gangrene infections more apt to occur in those localities than in our own country. Those germs of the gas bacillus are present everywhere here in Chicago as well as in Belgium. If we have extensive gunshot injury or extensive injury from any other violence which produces extensive devitalization of the tissues and drives dirt and clothing deeply into the tissues if the patient is not given the benefit of good surgery which would mean early removal of these devitalized tissues foreign bodies clothing etc. the same destructive infections will result. That they have resulted so much more frequently in military surgery than in civil practice is due to the fact that these horribly lacerated wounds with masses of devitalized tissue and impregnated with dirt and foreign bodies are necessarily much more common in war than in civil life. Again, that they are more common in war than in civil life is due in part at least to the fact that in civil life these cases are more apt to receive prompt and immediate attention within a few hours after receipt of the

injury In war, many of these cases lie out in No Man's Land for hours until the favorable period for handling the cases surgically is passed and until the infection is well established It is now a well recognized fact that if these cases can be handled within what is known as the period of contamination within the first six or eight hours after receipt of the injury and the devitalized tissues removed and the dirt and foreign bodies removed by cleanly dissecting out the wound we are able in 80 to 90 per cent of the cases to sterilize this wound as we can sterilize the field of operation in making an aseptic abdominal operation and secure primary union by suture without drainage provided the limb has good circulation In this particular case if we had seen the case within the period of contamination within the first six hours we would have found at the time of the examination whether or not the popliteal vessels were so extensively injured that amputation was required The amputation could have been made in this period of contamination with good technic so as to practically eliminate the danger of suppuration and gas gangrene

Note—A careful dissection of the amputated limb showed that there was a gross injury to the popliteal vessels cutting off the blood supply completely making gangrene certain

ABSCESS OF THE LUNG

Summary Abscess of the lung as a sequel of tonsillectomy the two-stage operation—danger of producing empyema and a method of avoiding it

January 10 1919

THE patient upon whom I shall operate this morning is a woman of thirty five who has been transferred to my service from the service of Dr James B Herrick with the diagnosis of abscess of the lung Dr Herrick has given me the following history of the case

She had a tonsillectomy some weeks ago and this was followed by pneumonia gangrene of the lung and the development of a lung abscess I saw the patient first about three weeks ago and she was then coughing up a good deal of foul material having the peculiar odor that is so frequent in cases of lung gangrene I advised no operative interference at that time though the physical findings were quite suggestive of lung abscess Examination with an exploring needle had failed to locate the abscess definitely

After our first consultation the woman improved decidedly for a week or ten days and the temperature came down and we were in hopes that she would go on to recovery without requiring any surgical interference Her symptoms however have recently become more marked the temperature has again gone up the cough is very distressing and the x ray findings are now very definitely those of lung abscess The clinical picture is also perfectly consistent with the diagnosis of lung abscess She coughs up at intervals considerable quantities of

I am going to operate upon this case under local anesthesia We are doing practically all of our lung abscesses now without a general anesthetic and I am very well satisfied with the use of local anesthesia I shall use $\frac{1}{2}$ of 1 per cent apothesine with

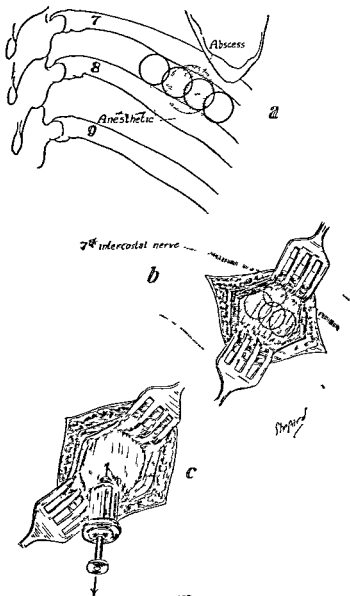


Fig 107

a little adrenalin. The x ray plate shows that the abscess is in the seventh intercostal space 4 inches to the right of the spinous process. Before using the aspirating needle I am going to divide the tissues in this seventh intercostal space for a distance of about 2 inches in length down to the parietal pleura and then I am going to determine whether or not the pleural space is obliterated at that point by adhesions between the parietal pleura and the visceral pleura. Infiltrating the tissues for about 3 inches I divide parallel with the seventh intercostal space first the skin and then the superficial fascia and come down now to the latissimus dorsi muscle which crosses the line of my incision almost at right angles. I shall divide the fibers transversely and not attempt to do a muscle splitting operation because I want to obtain free unobstructed access to the intercostal space. I now come to the external intercostal fascia covering the external intercostal muscle. I free this fascia until I can see clearly the fibers of the intercostal muscle. I infiltrate this and also the internal intercostal muscle and I shall also block the intercostal nerve in its space in the groove under the seventh rib by injecting 20 or 30 drops of the solution in close contact with its sheath. I now divide the internal intercostal muscle and come down to the parietal pleura. I find that this is normal in appearance and I can see during respiration the movement of the lung showing that there is no obliteration at that point.

With a fine needle I now anesthetize the parietal pleura itself and insert my exploring needle. I introduce it in the position which I think the abscess occupies. You will see that I at once draw into the syringe a fine stream of pus. I simply withdraw a few minims of the pus and make no effort to evacuate the cavity. I want to call your attention particularly to the fact that the needle which I am employing is a very fine one

Fig 107 —a, Location of abscess opposite seventh intercostal space and cutaneous area anesthetized with novocaine.

je
in
by wgt.

which will probably not permit of any leakage from the lung abscess into the pleural cavity when we withdraw it (Fig 107, a, b c)

What shall we do now with this case? If I open the abscess at this sitting I am almost certain to produce a very acute empyema on this side, which would be a most serious menace to the woman's life. Experience with a number of similar cases has taught us that it is much wiser to operate upon a case of this kind in two stages the first stage which we have completed this morning, which should be associated with a procedure that will ensure obliteration of the pleural cavity at this point by an adhesive inflammation between the parietal and visceral pleura. Experience has taught me that the simplest and surest way of securing this is by the method which I shall now proceed to follow.

I shall pack some iodoform gauze into this wound doing this very carefully, and I shall push the parietal pleura in front of this gauze probably $\frac{1}{2}$ inch from the surface of the ribs for an area as large as that of a silver dollar. This presses the parietal pleura against the visceral pleura with this mass of gauze inside of the chest cavity, but outside of the pleural cavity. The pressure is sufficient to secure adhesive inflammation in this area within four or five days. We can then proceed with the second stage of the operation, that of definitely locating the abscess with a needle and with the electric cautery cauterize a canal through the lung tissue probably the size of my little finger of sufficient size at any rate to secure good drainage of the pus. I shall not close the external wound in this case at all. I simply pack it with a little iodoform gauze and leave it open so as to make it accessible for the second stage of the operation.

I want to draw on the blackboard a diagram showing you the location of this iodoform gauze pack. This will give you a fair conception of just what is accomplished by it (Fig 108 d)

AFTER HISTORY

Four days after the operation the patient was again sent to the operating room the gauze was removed very gently after

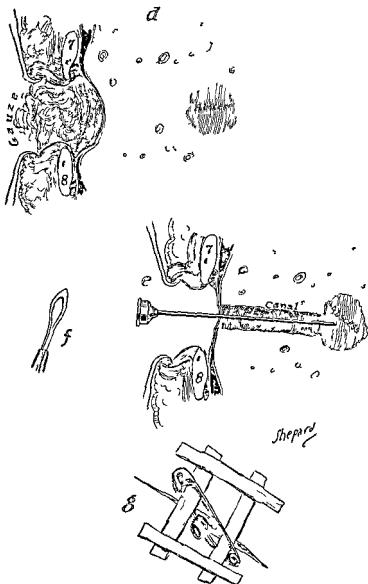


Fig 108—d Completion of first stage of operation gauze pack occluding pleural cavity opposite abscess c abscess located with large needle and tract burned out by cautery (f) using needle as guide g method of anchoring drainage tube.

which will probably not permit of any leakage from the lung abscess into the pleural cavity when we withdraw it (Fig 107 *a b c*)

What shall we do now with this case? If I open the abscess at this sitting I am almost certain to produce a very acute empyema on this side which would be a most serious menace to the woman's life. Experience with a number of similar cases has taught us that it is much wiser to operate upon a case of this kind in two stages the first stage which we have completed this morning which should be associated with a procedure that will ensure obliteration of the pleural cavity at this point by an adhesive inflammation between the parietal and visceral pleura. Experience has taught me that the simplest and surest way of securing this is by the method which I shall now proceed to follow.

I shall pack some iodoform gauze into this wound doing this very carefully and I shall push the parietal pleura in front of this gauze probably $\frac{1}{2}$ inch from the surface of the ribs for an area as large as that of a silver dollar. This presses the parietal pleura against the visceral pleura with this mass of gauze inside of the chest cavity but outside of the pleural cavity. The pressure is sufficient to secure adhesive inflammation in this area within four or five days. We can then proceed with the second stage of the operation, that of definitely locating the abscess with a needle and with the electric cautery cauterize a canal through the lung tissue probably the size of my little finger of sufficient size at any rate to secure good drainage of the pus. I shall not close the external wound in this case at all. I simply pack it with a little iodoform gauze and leave it open so as to make it accessible for the second stage of the operation.

I want to draw on the blackboard a diagram showing you the location of this iodoform gauze pack. This will give you a fair conception of just what is accomplished by it (Fig 108 *d*)

AFTER HISTORY

Four days after the operation the patient was again sent to the operating room the gauze was removed very gently after

CONGENITAL PYLORIC STENOSIS

Summary A patient six weeks of age presenting typical symptoms of congenital pyloric stenosis the Rammstedt operation under local anes-
thesia a technic of closure of abdominal incision—necessity for special
care congenital pyloric stenosis not a condition warranting medical
management

January 13 1919

I SHALL operate this morning a case of congenital pyloric stenosis. I want to present to you a technic which I regard as being of very great importance in this condition and as a great improvement simplifying the operation and I think without any question greatly reducing the mortality both from the operation and from the condition itself. I shall ask you therefore, to follow me closely in the technic which I shall adopt in this case.

This child is six weeks of age. It has the typical clinical picture of congenital pyloric stenosis. Up to about the tenth or twelfth day the child's general condition was good and nothing unusual was noted. It then began to vomit and the vomiting became more and more persistent after food taking until now very shortly after anything is introduced into the stomach it is ejected. The baby has lost weight and is in very bad condition and very weak thoroughly exhausted and very much emaciated and presents the picture of the wasting of starvation. There is present marked visible peristalsis. A tumor can be felt in the region of the pylorus and practically nothing goes through. There are no bowel movements. The child has been given fluids by rectum and an effort made to feed it by the stomach by the methods advocated by those who are opposed to operative interference and who are in favor of medical management. No improvement however has followed this scheme of solid diet. The baby is evidently in a condition where any general anesthetic would be a definite menace and I will not hesitate to say that this child's chances under our old form of surgical management of doing a gastroenterostomy under

it had been softened up with peroxid of hydrogen the inter costal space was held apart with retractors and it was found that adhesion had taken place between the visceral and parietal pleura permitting of the second stage of the operation. This was comparatively simple. A fair-sized needle was introduced about 2 inches into the lung and the abscess found. The needle was left *in situ* and with an electric cautery a canal was burned around the needle sufficiently large to introduce about a No 14 American catheter. This entered the abscess and permitted of the escape of pus (Fig 108 *e f g*)

The patient had a rather sharp reaction after this operation in the way of rise in temperature up to 103° F. The coughing gradually diminished. The discharge from the tube has been fairly profuse. The temperature is also diminishing approaching normal and she is on the road to a good recovery.

The after history of these cases however is by no means a perfectly satisfactory one only about half of the cases going on to complete recovery, the other half requiring permanent use of the drainage tube for months or years or a secondary operation such as a thoracoplasty permitting the collapse of the chest wall at that point to obliterate the cavity in order to secure permanent recovery.

I want to again emphasize the fact that this case followed a tonsillectomy and that it is about one out of a dozen or more lung or brain abscesses that we have had on our service which have followed the apparently simple and supposedly safe operation of removal of the tonsils an operation however which as a matter of fact carries with it as shown by the experience of this clinic a very grave danger. To be sure this occurs in but a small percentage of the cases but this complication is so serious that it is a strong argument against doing tonsillectomies unless the indication is absolute. The indiscriminate massacre of the tonsils which is going on at the present time should be strongly opposed by the judicial element of the profession and unwarranted and unnecessary operations prevented in the future.

ether anesthesia would almost certainly be zero. Fortunately, however, we have been able to simplify very much the technic required to relieve this mechanical obstruction, and we have accomplished this by adopting two plans of procedure, which I shall describe to you in detail. First, the very simple and efficient operation of Rammstedt, and second, what I regard of equal importance in these cases, we are now doing the operation under local anesthesia.

The child has been surgically prepared and I shall proceed at once to the operation. I infiltrate the skin over the upper part of the right rectus muscle for a distance of about 2 inches. I then infiltrate the superficial fascia and the anterior sheath of the rectus itself. I am using the usual solution employed in this clinic ¹ of 1 per cent apothesine with 1:100,000 adrenalin. It requires, as you see, but a very limited amount of this solution so limited that there is no danger whatever of any toxic effect from the local anesthetic (Fig 109 *a*). I now make an incision 2 inches in length, beginning a little below the costal arch and divide the skin and superficial fascia and anterior sheath of the rectus and split the rectus muscle itself. You will notice that the child cried when we injected the solution with the hypodermic syringe but that during the cutting of the tissues it lies perfectly quiet as though it experiences no sensation whatever. The split rectus muscle is now held apart by two retractors and I infiltrate the posterior sheath of the rectus and peritoneum with 30 or 40 drops of the solution (Fig 109 *b*). I now divide these and expose to view first the round ligament which I pull to the right side and then the margin of the liver itself. To the left of this I pick up the great curvature of the stomach with a pair of dissecting forceps without any teeth so as to avoid injuring it. I now gently pull the pylorus into view and you will notice that there is a good sized tumor at the pylorus, particularly large in this case, as large as the end of my index finger. It is white, hard, and

Fig 109—Congenital pyloric stenosis. *a*, Infiltration over right rectus muscle. *b*, Infiltration of posterior sheath of rectus and peritoneum. *c*, Stomach pulled out, bringing pylorus into view.

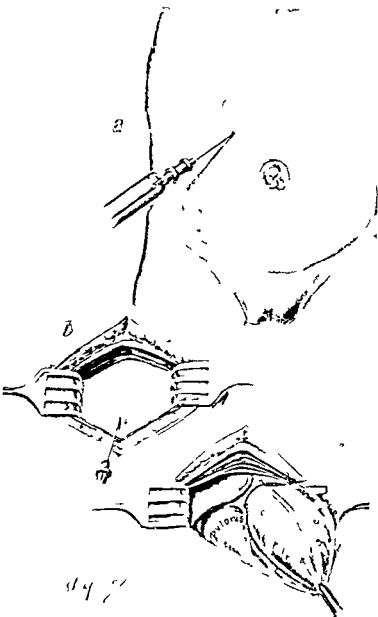


Fig 109

clinic a number of times—the great importance of making a very accurate closure of the abdominal wound in these cases, because wound repair is so slow in these little starved patients that the

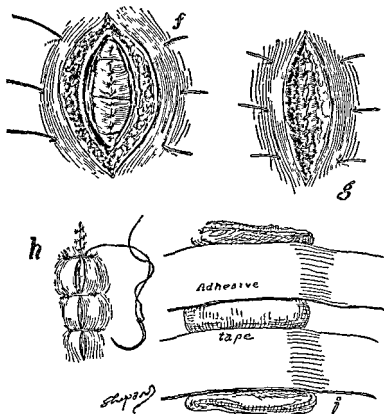


Fig 111—*f*, Peritoneum and posterior sheath of rectus closed, silk-worm gut stay sutures placed, *g*, rectus and anterior sheath sutured, *h*, superficial closure, *i*, gauze dressing over wound held by strips of adhesive tape

accident of opening up of a part of the wound after the sutures are removed is one of the dangers of the procedure, and this can be avoided by good technic. I close the peritoneum and posterior sheath of the rectus with a moderately fine catgut

grizzle like (Fig 109 *c*) I grasp it between the thumb and finger of the left hand and selecting an avascular area I divide the peritoneum and a part of the hypertrophied muscle fibers with a knife (Fig 110 *d*) I then take a small pair of artery forceps and introduce them closed into the incision and then gently open them and spread the incision farther apart (Fig 110 *e*) I do this first toward the stomach side of the incision, and you will notice as I separate completely the hypertrophied circular muscle fibers a white fold comes into view

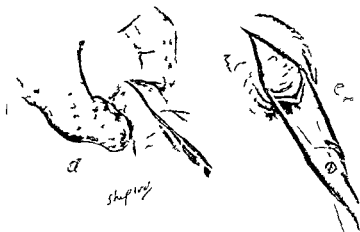


Fig 110—Congenital pyloric stenosis *d* Incision through peritoneum and muscularis *e* incision stretched with forceps

It is the submucosa and I extend the separation until I reach the duodenum. At this part of the separation I am particularly careful because the mucous membrane of the duodenum is much more delicate than that of the stomach and I desire to avoid any injury whatever and especially avoid making a perforation of its mucous membrane. There is practically no bleeding and I drop the pylorus back into the abdominal cavity and close the external incision.

I want again to emphasize what I have emphasized in this

relieve it by a Rammstedt operation if a gross organic stenosis is found and that it is much safer to do this than to make an extended trial of medical management. The pediatricians on the staff of the Presbyterian Hospital agree fully with the views which I have expressed. There are however a few pediatricians in the country still inclined to the medical management of these cases. I would like to have them reconsider this whole question in the light of the simplified and safe procedure which I have been able to present to you this morning.

suture I use three silkworm-gut sutures through and through the rest of the abdominal layers (Fig 111 *f*) I close the anterior sheath with catgut and the skin with fine black silk (Fig 111 *g h*) In addition to that after applying a small dry sterile gauze dressing I strap the wound with broad adhesive strips about 2 inches in width which go about two-thirds around the child's body (Fig 111 *i*) I want to particularly emphasize this point because even after the stitches are removed at the end of the tenth day this broad adhesive strap dressing should be replaced in order to prevent the possibility of opening up the wound which of course is a serious and often fatal accident in these cases

May I not take the opportunity of stating that I believe that with the local anesthesia and this Rammstedt operation we have at our disposal a very safe and very efficient method of handling congenital pyloric stenosis I am personally not competent to criticize the medical management that has been advocated by a good many men in these cases as opposed to surgical interference but as a surgeon I believe very strongly that in cases such as I have operated on this morning and such as we have had in 30 or 40 similar cases in the Presbyterian Hospital where a definite tumor is found such as we have found here I cannot understand how it is possible for any scheme of feeding to overcome this gross definite mechanical obstruction. Personally I am thoroughly convinced that the cases which are cured by medical management are either cases of mistaken diagnoses or of congenital pyloric stenosis of a minor degree and not such gross definite obstructions as we have here this morning and as we have found almost invariably in the cases we have operated upon. I want to submit this proposition to you for with our present simplified technic of doing these cases under local anesthesia and by this Rammstedt method we have now at our disposal a method that is so safe and so efficient that we should not hesitate to give these poor little chaps even in doubtful cases the benefit of the doubt and before allowing them to get into a grave condition from starvation we should make an exploratory and determine definitely the condition and

CARCINOMA OF THE LARYNX

Summary Recurrence of cancer following thyrotomy and local excision of a laryngeal carcinoma radical laryngectomy under local anesthesia technic after treatment—method of feeding patient—position in bed indications for operative management of cancer of the larynx.

THE case which I shall present for your consideration this morning is that of a man seventy two years of age, who came to us about eight months ago with a small carcinoma of the larynx. It seemed to be a case that was very favorable for local operation. I therefore decided that instead of doing a laryngectomy I would do a thyrotomy expose the lesion fully, and after spreading open the thyroid cartilage cut it out thoroughly with the electric cautery knife. This operation was done under local anesthesia, and the patient made an admirable recovery and seemed to be in very good general condition. Recently, however he has had a return of his symptoms and comes back to us with a definite recurrence distinctly larger than the original growth. I have gone over the case carefully with our laryngologist, Dr McGinnis and we have discussed two plans one of using radium and second, radical removal and complete laryngectomy. In weighing the facts and attempting to make a choice of procedure I have come to the conclusion that it would be better to do a complete laryngectomy and I have submitted this to the patient and he has consented to the operation. I feel that radium would certainly be but palliative and as it would necessitate the doing of a tracheotomy in order to prevent death from edema of the larynx from the sharp reaction that radium produces, I am strongly inclined to prefer a radical operation.

I shall do this under local anesthesia, using $\frac{1}{2}$ per cent apothesine as we have been doing in this clinic for some time. I have already given the patient $\frac{1}{4}$ grain of morphin and $\frac{1}{150}$ of atropin as I think that this will give him some additional comfort during the long and tedious operation. I begin now and infiltrate in the median line from just above the hyoid down to

the sternum and then infiltrate a line transversely to this just above the hyoid, making an incision shaped like a cross (Fig 112, *a, b, c*) I infiltrate this widely and shall use probably in the operation 5 or 6 ounces of the anesthetizing solution I am sure that the operation will be very tedious and difficult because of our experience with similar cases that have been previously operated upon I shall first dissect out the old scar of the previous operation, and, as I expected, the tissues are very vascular and the dissection made very difficult by the scar tissue binding the soft tissues widely to the thyroid cartilage and the trachea You see that it is necessary to employ a large number of artery forceps grasping every single bleeding or oozing point I now gradually separate the sternohyoid and sternothyroid muscles on either side from the trachea and divide their attachments into the thyroid I also divide the attachments of the thyrohyoid muscle at its insertion into the thyroid cartilage I come down now just below the thyroid cartilage to the lobes of the thyroid gland I divide the isthmus or, rather, the scar tissue at the point of the isthmus and free the trachea completely by lifting the lobes of the thyroid from it This requires a clean dissection with a knife The tissues bleed rather profusely By lifting the bleeding edge of each half of the thyroid I control this bleeding by suturing it with fine catgut suture I now very carefully and very completely free the larynx, separating all the soft tissues from it and also from the trachea as far down as the sternum (Fig 113, *a, b*) Holding the soft tissues apart with retractors so as to expose the larynx and trachea, I now divide the trachea just below the cricoid transversely and open into it You notice at once that the noisy breathing ceases entirely as I obtain a large opening into the trachea I hold this opening apart with two sharp hooks and

Fig 112—*a*, Infiltration of skin for laryngectomy T shaped incision is indicated by heavy black line *b* larynx and trachea skeletonized from thyrohyoid membrane to upper border of sternum anesthetizing solution injected into wall of trachea just below cricoid cartilage—it is at this level that the trachea is severed *c* cocaineization of mucous membrane of trachea and larynx to prevent coughing and other reflex disturbances from the irritation incident to further operative procedures

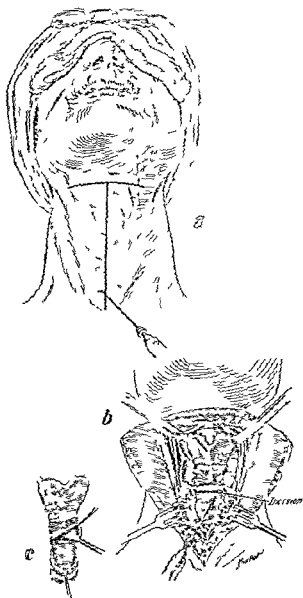


Fig 112

cocainize the mucous membrane of the trachea and larynx with 1 per cent solution of cocain on a little cotton applicator. I am very careful to avoid allowing any blood from the wound to trickle into the trachea or larynx (Fig 113, c). Waiting for a few moments to obtain the effect of the cocain, I now continue the dissection and separate the larynx from the esophagus behind. I do this with some difficulty on account of the previous operation, and there is a good deal of connective tissue which binds the esophagus and the trachea together. Grasping the trachea with a pair of forceps I now separate the trachea from the esophagus downward toward the sternum. I shall suture the trachea into the lower angle of this wound with six or eight black silk sutures. You will notice that we are not using a tracheotomy tube. I do not intend to use one either during the operation or if possible in the course of the after-treatment. Patients do very much better without a tracheotomy tube in these cases if its use can be avoided. I now grasp the larynx with a pair of volsellum forceps and pull it upward toward the chin and separate the esophagus from it up to the internal opening of the larynx. I then divide the esophagus from the larynx and continuing my dissection, separate all the ligaments and muscles attached laterally to the larynx, and finally divide the thyrohyoid membrane and remove the entire larynx, including the epiglottis.

We have had splendid co-operation on the part of the patient during this long and trying operation. We have now a large T shaped opening in the esophagus which must be closed, and I close this with fine Pagenstecher linen just as I would

Fig 113—a Schematic sagittal section through operative field. By

the lower angle of the wound it is protected from contamination by blood or buccal secretions by a strip of gauze. b the triangular opening in esophagus and pharynx left by the removal of the larynx is tightly sutured. c, operation completed. Gauze drain in each end of the transverse incision and trachea sutured into lower angle of sagittal incision.

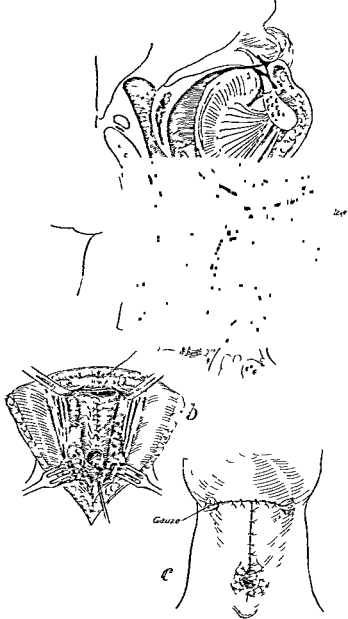


Fig 113

much more comfortable in this semi-elevated position than they are in a recumbent position, and I believe there is less danger of a resulting pneumonia.

I want to express to you my views about the surgical handling of these cases of carcinoma of the larynx based upon the experience which we have in this case and the experience which we have had now in a considerable number of cases. In small carcinomas of the larynx I have hesitated to urge a complete laryngectomy, and I have tried now in a number of cases to cure the patient by the local operation of thyrotomy and simply destroying with the electric cautery the portion of the larynx involved. I have however, during the last year had the unfortunate experience in three of these cases to find that the lesion recurred. On the other hand, in those cases in which we have done a laryngectomy we have been fortunate in curing a great majority of them when we have operated at a time when the lesion was still intrinsic and did not involve the tissues outside of the larynx. In handling these cases, therefore, we are prone to give the patient the benefit of the less mutilating operation of thyrotomy and local removal of the cancer when the lesion is small instead of proceeding at once to do a complete laryngectomy. On the other hand, the results of our complete laryngectomies have been so much better from the standpoint of permanent cure than the results obtained by the minor operation that I confess I am growing more and more converted to this point of view, that local operations in the larynx for cancer are not often curative and require in the large majority of the cases a later complete laryngectomy, the patient in the meantime running the risk of such invasion of the tissues as to make a laryngectomy impossible or one that carries with it much danger of recurrence. Now, on the other hand, a complete laryngectomy done for cancer of the larynx when the lesion is small gives an excellent prospect of permanent cure, probably as good or a better prospect of cure as operating for cancer in any other position of the body. The cancer is enclosed in a cartilaginous box, lymphatic involvement is slow and late, and when the lesion is distinctly intrinsic I do not hesitate to

sew up the intestine I cannot make an absolute waterproof closure because these tissues do not lend themselves to accurate approximation as does the intestine but it is not essential to have an absolute water tight closure at this point I now close the large skin incision with silkworm gut sutures and pack in each angle of the transverse incision a strip of iodoform gauze down to the point of closure of the esophageal opening and at the lower angle I also introduce a very small piece of iodoform gauze for $\frac{1}{2}$ inch between the trachea and the sternum.

The after management of this case is of great importance and must be carried out with great care For the first twenty four hours we shall give the patient normal salt solution by rectum After that it will become necessary that we feed him through the esophagus and we have worked out an efficient and successful technic for this purpose Assuming that the posterior wall of the esophagus is intact we carefully introduce at the end of twenty four hours a No 14 American rubber catheter through the mouth into the esophagus and well down the esophagus for a distance of about 10 inches and then with a funnel pour the necessary amount of water milk thin gruel etc. into the stomach. This prevents any leakage of food through the esophageal wound and supplies the patient with the necessary amount of nourishment. This method of feeding the patient must be continued from ten to fourteen days The patient is in some shock and for the first few hours I shall leave instructions to have the head of the bed lowered or rather the foot of the bed elevated so as to place the head about 12 to 18 inches lower than the foot. This position is favorable to counteracting shock and at the same time by gravity there will be a tendency for any blood or mucus to run down and out of the trachea lessening to a certain extent the danger of aspiration pneumonia However within a few hours when the patient has reacted let us say eight or ten hours after operation we shall reverse the position and put him up in bed at an angle of about 30 degrees on a back rest. By that time he will have so far recovered that he can cough up the sputum and blood and we have found from experience that patients are

CLINIC OF DR FRANKLIN B McCARTY

RUSH MEDICAL COLLEGE

FRACTURE OF THE CARPAL SCAPHOID

Summary Mechanism and types of fractures symptoms—crepitus deformity and false point of motion lacking demonstration of local tenderness diagnosis treatment of uncomplicated fracture—of fracture with dislocation—of old cases

FRACTURE of the carpal scaphoid is a common injury infrequently diagnosed and consequently often followed by permanent disability of the wrist. Many wrist injuries which show no injury to the radius or ulna are treated as sprains with unsatisfactory results simply because attention was not directed also to the small bones of the wrist wherein lay the real bony injury. The economic loss resulting from more or less marked permanent impairment of wrists of men in industrial pursuits makes essential the careful examination of the carpal bones in every injury of the wrist joint. The signs of this fracture are distinct and characteristic so that diagnosis from physical examination alone is not difficult. In an out patient clinic 23 cases were encountered in a period of two months and in each instance diagnosis was made previous to x ray examination.

Mechanism—This is essentially a fracture of adult men due largely to their greater liability to injury of the type which produces such fracture. It occurs almost always in young men of good development who are engaged in muscular work or sport. Injury occurs by direct violence transmitted through the hand rarely by a blow directly over the bone. There is a history of a fall backward with hand and arm rigidly outstretched so that the full force of impact is received on the ball of the thumb the hand being hyperextended and deviated toward the ulnar side (Fig 114)

state that I believe the majority of cases can be cured permanently by complete laryngectomy. The patients, to be sure, are rather in a somewhat handicapped condition, but, surprising as it may appear, they endure this handicap very cheerfully and soon learn to breathe comfortably through the trachea just above the sternum, they learn to protect it with a little wire screen covered with gauze, and they enjoy life as much as any patients I have ever operated upon. The difference between difficult breathing and danger of death from cancer of the larynx compared with perfectly free breathing and a knowledge that they have been relieved of their cancer is most gratifying to these patients. I am rather inclined to analyze this whole subject in a judicial way and to give you these conclusions that in very small carcinomas of the larynx, early discovered thyrotomy and local removal may be justified. If this operation is done, however, one should recognize the very considerable dangers of recurrence. I state this on the basis of my experience, if there is the slightest evidence of recurrence an immediate laryngectomy should be made. In several of my permanent cures in laryngectomy for cancer of the larynx we have had identically the same experience as we have had in this case, first, the attempt at local removal and recurrence, and finally a complete laryngectomy with permanent cure. In carcinoma of fair size involving both sides of the larynx or involving one side completely I would not hesitate to advocate very strongly a complete laryngectomy.

of the scaphoid lies almost directly in line with the forearm and the entire force of the blow is transmitted through it. Fracture occurs at the narrowest and weakest part—the middle of the arch, the concavity of which is reinforced by bony support from the os magnum, but the convexity of which is unsupported except by ligaments. The same situation exists as when a curved stick, thick at both ends and narrow in the middle, is stood endwise on the ground and struck a heavy blow on the upper end. Naturally, the fracture occurs transversely across the narrowest portion. It is notable that fracture of the scaphoid is rarely complicated by other bony injury, whereas fracture of the lower end of the radius is commonly accompanied by fracture of the ulnar styloid.

The fracture may be clean cut or comminuted and impacted, the former being the rule (Fig 115, *a, b, c*). The line of fracture runs transversely across the narrow neck, and is so located that the upper fragment includes the entire radial, the semilunar, and part of the os magnum articulations, forming a fragment which is almost entirely articular and which is attached only to the annular ligament, firmly in front and loosely behind, and by the intercarpal ligament to the semilunar bone. Hence the mobility and more frequent tendency to anterior displacement of this fragment rather than the distal one, which is firmly wedged and bound into place. Casual examination of a dislocated proximal fragment of scaphoid may readily lead to confusion, both clinically and by x ray, with dislocation of the unfractured semilunar. Stereoscopic x ray definitely clears up any question of diagnosis.

Symptoms—The symptoms of simple scaphoid fracture are, in general, those of sprain of the wrist, without the accompanying physical signs of sprain. The outstanding symptoms of fresh fracture are pain, tenderness, limitation of motion, weakness and swelling. The other cardinal signs of fracture—*i. e.*, crepitus, deformity, and false motion—are lacking, nor is ecchymosis often found.

1 *Pain* is of moderate severity, but very persistent. With the hand at rest and supported, so that the muscles are inactive,

The scaphoid has roughly the shape of a hollowed out crescent with blunt ends and a constricted neck near the middle. The proximal half is almost entirely articular and the distal portion is largely fixed by ligamentous attachments. With the hand hanging by the side the concavity of the bone fits snugly against the rounded surface of the os magnum so that in falls with the wrist extended and not deviated to either side the two bones act practically as one and the force is transmitted higher

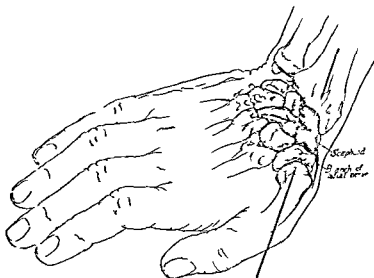


Fig. 114.—Mechanism of fracture of carpal scaphoid. Arrows show direction of force. Note branch of radial nerve running over posterolateral aspect of scaphoid, pressure on which causes pain which may occasionally lead to confusion in diagnosis.

up with resultant injury to the radius or to the styloid of the ulna. With the hand extended and deviated to the ulnar side however there is a certain amount of play in the wrist joint the proximal articular portion of the scaphoid moving laterally while the distal portion remains fixed in place. This change in position may be easily demonstrated by placing the finger tip over the upper end of the snuff box and alternately adducting and abducting the hand. As a result of this motion the long axis



Fig 115.—Sketches from x ray plates illustrating different types of fracture *a*, Old untreated fracture with crescentic bone absorption of proximal fragment, *b*, simple transverse fresh fracture, *c*, comminuted fresh fracture

there is little pain even in recent injury. When the hand is used and the joint put into motion pain is quite marked and becomes intolerable when extremes of motion are attempted. Particularly is this true of hyperextension and adduction, either of which motions produce severe pain localized to the radial side of the wrist and definitely below the line of the radial articulation. Sharp pain is also elicited on pressure directly upward against the ball of the thumb directly in the line of the radius.

2 *Tenderness* is definitely limited to the region of the bone itself. The proximal half of the bone lies directly beneath the snuff box, the hollow depression formed between the tendons of the extensor longus pollicis and extensor brevis metacarpi pollicis when the thumb is extended and abducted and is practically subcutaneous at this point. With the thumb placed on the anterior surface of the wrist directly below the lower end of the radius and just medial to the tendon of the extensor brevis metacarpi pollicis the anterior surface of the bone may be palpated by direct pressure backward. With the index finger tip over the snuff box and the thumb-tip in the latter position the bone can be rocked backward and forward between the fingers (Fig 116 a). Such a maneuver causes considerable pain in certain normal wrists due to pressure on a branch of the radial nerve which traverses the snuff box diagonally and normally winds about the neck of the bone on its dorsal surface (Fig 114). It is probable that in the normally sensitive scaphoids the nerve lies higher or lower on the flat exposed surface of bone. This tenderness may easily be mistaken for that associated with fracture. The tenderness of nerve pressure commonly lies lower in the snuff box, is bilateral and often radiates up the dorsolateral surface of the forearm to a point just below the elbow. It diminishes on continued pressure whereas fracture pain tends to increase.

Tenderness of true fracture is definitely limited to the line of separation across the neck of the bone. The injured hand is grasped as in an ordinary hand clasp, thus supporting the wrist and overcoming spasm. With the index finger of the free hand

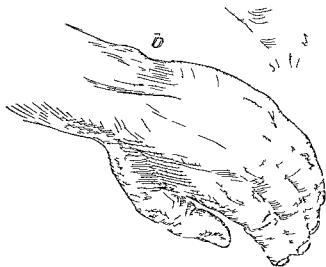
the styloid process of the radius is made out and the snuff box is palpated with firm pressure of the finger tip. When the site of fracture is reached pain is produced definitely enough to cause the patient to wince. This pain is more acute and definite than that accompanying simple sprain.

3 *Limitation of motion* is characteristic. Hyperextension is limited even a slight degree causing some pain and extreme extension causing excruciating pain. Lateral motion is limited especially toward the ulnar side. Finger movements are unimpaired with the wrist in extension but are somewhat limited by pain when the wrist is flexed. Gripping power is markedly diminished and certain special activities are noticeably deficient. Pushing with the extended hand against resistance as in pushing open a swinging door causes acute pain and weakness as does rotary motion such as driving a screw-driver the lack of power occurring only with forcible pronation not at all with supination. In other words the individual can drive a screw in but cannot unscrew it.

4 *Swelling* in simple fracture uncomplicated by sprain is notably slight and is limited to the dorsolateral surface of the wrist. Sprains of various degrees of severity may accompany fracture and show considerable general swelling.

As an illustration of the average case of fractured scaphoid I shall read the following report of a case seen by me several years ago.

CASE I.—Mr P O aged thirty five architect. No previous history of injury to or weakness of wrist. Patient slipped on waxed floor and threw out left arm with hand outstretched receiving force of blow on ball of thumb. Noted pain on motion especially on pushing or leaning on extended hand and inability to grip tightly. Examination shortly after injury showed moderate swelling over the radial half of wrist joint on the dorsal surface with no evident deformity no discoloration or ecchymosis. Radial and ulnar styloids were in normal relation.



swelling were so mild that the attention of the physician in charge was not called to the wrist injury. Since that time the wrist has been weak and sharp pain has followed extreme motions and rotation particularly a sudden force applied against the fingers or palm of the extended hand. The wrist gives out during gymnastic and athletic exercises where weight or strain is thrown on it and the patient has noticed that more relief is obtained by a supporter which extends well down on the hand and up on the forearm than with the ordinary narrow wrist supporter. This is due of course to limitation of extension.

Examination shows limitation of extension and adduction weak grip weak pronation tenderness over the snuff box and anteriorly below the radial styloid. Such tenderness is not present in the right wrist. α Ray reveals transverse ununited fracture without callous formation and with marked absorption of the proximal pseudo articular surface.

Diagnosis The scaphoid lies densely surrounded by small bones ligaments and tendons so that diagnosis of injury is sometimes difficult. Injury is less common than of the bones above the radiocarpal joint and more common than of the other carpal bones. Fracture occurs often in adult men infrequently in women and almost never in children because of the relatively late date at which ossification of the bone occurs. Ossification is usually evident by α ray at the age of six or seven but massing of the bone with the rest of the carpal bones is delayed until the twelfth year.

Four types of injury may cause error in diagnosis they are in order of frequency

- 1 Injury to soft parts—sprain
- 2 Injury to bone above the radiocarpal joint
- 3 Injury to other carpal bones—fracture or dislocation
- 4 Separation of centers of ossification in a normally ununited scaphoid

Sprain is associated with diffuse swelling over the entire wrist front and back tenderness of soft parts more marked on anteroposterior than on lateral pressure and limitation of motion in all directions.

Tenderness was localized to the outer third and lateral surface of the wrist below the radial articulation, and the point of maximum evincing tenderness was definitely over the snuff box. Pain was elicited by hyperextension adduction, and by pronation against resistance. The grip was painful and decidedly lacking in power as compared with the other hand. Finger motions were unimpaired.

x Ray showed impacted transverse fracture of the scaphoid.

During convalescence callus could be felt over the site of fracture, this being due to the rather unusual amount of comminution with excess of callous formation.

Excellent anatomic and functional result after simple fixation.

Symptoms in Old Injury—Old untreated or improperly treated cases of fracture show persistence of all of the signs of fresh fracture, less marked but still definitely demonstrable. This is due to the fact that such cases rarely obtain bony or adequate fibrous union and the upper fragment persists as an entirely articular body, loosely attached and subject to unusual mobility when extremes of motion or force are attempted. Frequently there is an accompanying persistent arthritis.

The patient complains that his wrist gives out under hard use or prolonged work of a dexterous nature and notes especially lack of power in gripping and pain and weakness on hyperextension rotation and adduction. Examination reveals tenderness over the snuff box and a point of exquisite tenderness just below the radial styloid on the front of the wrist. Pain in the scaphoid region is produced by pressure directly upward on the ball of the thumb. Extremes of wrist motion are limited especially extension and adduction. x Ray examination shows the line of fracture usually without any union or evidence of callus and often with absorption of bone in the free proximal fragment, in which event the articular surface of this fragment is concave in shape.

CASE II.—Mr. A. L., aged seventeen, student. One year ago this patient was injured in a football scrimmage, resulting in a fracture of the external condyle of the right humerus and what was considered to be a mild sprain of the left wrist. Pain and

Diagnosis of fracture, then, rests on—

- 1 History of a fall on the extended hand
- 2 Signs of injury below the radiocarpal line
 - (a) Pain limited to the radial half of the wrist
 - (b) Tenderness over anatomic snuff box
 - (c) Limitation of motion, especially hyperextension and adduction
 - (d) Muscular weakness especially with rotary and gripping motion
- 3 Absence of—
 - (a) Bony deformity of radius
 - (b) Shortening of radial styloid
 - (c) Crepitus
 - (d) Ecchymosis or marked effusion
 - (e) Bony deformity on anterior surface of wrist medial to tendon of extensor longus pollicis

4 *x*-Ray—particularly stereoscopic *x* ray—which clearly shows any misplacement of fragments

Error in diagnosis is one of two kinds—a fracture may be overlooked or fracture may be suspected when none is present. The former is due either to entire failure to consider injury of the carpal bones or to the lack of those physical signs which might be expected to accompany bony injury. The latter is more likely to occur with old than fresh injuries.

Treatment—To be effective, treatment must be applied within a few days of injury. When so applied and properly maintained the outlook for an effective wrist is good. Neglect during the first three weeks means permanent impairment. The bone is intracapsular, is constantly bathed in synovial fluid, the amount of which is increased because of the constant motion between fragments and non union results.

1 *Uncomplicated Fracture*—Fixation of the wrist is all that is required in simple fracture. Moderate impaction is not manipulated because this highly desirable condition may be thus broken up. Impacted fractures unite most rapidly and attain the best permanent result. Severe comminution may require open operation but even in severe cases an attempt

The commonest bony injury above the radiocarpal joint is Colles' fracture, which gives rise to diffuse swelling pain on motion, localized tenderness over the site of fracture, and on lateral rather than anteroposterior pressure. There is found also silver fork deformity, crepitus and abnormal mobility in simple transverse fracture or shortening of the radial styloid, and bony thickening about the site of fracture, without crepitus or mobility if the fracture is impacted.

Of the other carpal bones the semilunar alone is injured frequently enough to warrant consideration. The lesion here is an anterior dislocation alone or in association with fracture of the scaphoid. Dislocation of the proximal end of a scaphoid may readily be mistaken for a dislocated unfractured semilunar. For purposes of diagnosis anterior dislocation of the semilunar and posterior dislocation of the os magnum are classed together. Study of 118 cases of carpal injury, the diagnosis of which was confirmed in each instance by x-ray, revealed the following types of injury:

Uncomplicated fracture of scaphoid	104
Fracture of scaphoid, with dislocation of fragment	4
Dislocation of semilunar	5
Fracture of pisiform	2
Fracture of os magnum	1
Fracture of unciform	1
Fracture of cuneiform	1

Two non-traumatic lesions were encountered: a bipartate pisiform and a retarded ossification in which latter the wrist of a woman of thirty-five showed only early centers of ossification in two bones.

Separation of the centers of ossification of a normally united scaphoid has been described from cadaver specimens, but no actual examples have been demonstrated in the uninjured wrist by x-ray or in the injured wrist at operation. It is safe to say that clinical signs of fresh or old injury with bony separation as shown by x-ray indicate pathologic fracture rather than separation of a bipartate bone.

instead of one Arthritis is a common and distressing complication

Manipulation and fixation in such cases is valueless, and only two courses remain open—to allow the patient to continue with a usable but functionally impaired wrist, or to perform open operation and remove the free fragment. The operation is simple, can be done under local anesthesia, will lay up the wrist for several weeks and will give an ultimately good joint. It will not, however, result in a wrist of normal strength or flexibility but will give a strong painless joint which is limited in the extremes of motion. When disability is pronounced and the hands are constantly used the benefit from relief of pain may be sufficient to warrant risking a loss of strength. In most instances pain and disability are sufficiently relieved by supporting bandage or apparatus so that the patient declines a radical procedure.

In general, scaphoid fractures are easily diagnosed by careful clinical examination and treatment instituted at once results in a high proportion of functionally normal wrists, whereas neglect of treatment for two or three weeks results in permanent disability. Early diagnosis, verified by *x* ray, is therefore essential for proper and adequate treatment.

is made first without incision. In simple transverse unimpacted fracture, the usual type of injury, we have a bone bathed in synovial fluid, with rather imperfect blood-supply and subject to constant motion. On this account bony or even solid fibrous union is slow and non union is liable to occur. It is, therefore, necessary to immobilize the joint for a somewhat longer time than in other wrist fractures. A plaster bandage is applied from finger clefts to the upper end of the forearm with the hand in direct line with the forearm, rather than in ulnar deflection, as in other wrist injuries (Fig 116, *b*). The plaster is allowed to *remain in place for three weeks*. During the fourth week passive motion is begun and at the end of that time the plaster is removed and a snug supporting flannel bandage is applied. So treated, the result will be a strong and supple wrist.

2 *With Dislocation of Fragments*—Dislocation is limited to the proximal fragment which is attached most firmly in front and medially, and so becomes dislocated on to the anterior surface of the wrist medial to the tendon of the extensor brevis metacarpi pollicis. It can be palpated as a firm body lying almost subcutaneously. Reduction is accomplished by manipulation. The wrist is extended and adducted to increase the space between radius and distal fragment and with pressure directly backward over the loose fragment the wrist is circumducted from right to left and the bone slips back into place. The plaster is then applied with the hand flexed and abducted.

The steps in reduction are

- 1 Extension and adduction of hand
- 2 Backward pressure with thumb over fragment
- 3 Abduction of hand
- 4 Flexion of hand

In general, open operation is contraindicated in fresh fracture, as nothing is gained and much may be lost by such a course. Removal of bone relieves pain and tenderness but undoubtedly results in more or less loss of strength in the wrist.

3 *Old Cases*—The untreated cases present a real problem as regards treatment. Usually they show some bone absorption and new joint formation, so that there are practically two bones

CLINIC OF DR VICTOR L SCHRAGER

COOK COUNTY HOSPITAL

A SUGGESTION IN THE TECHNIC OF THE RADICAL OPERATION FOR CARCINOMA OF THE BREAST. ROUTINE APPENDECTOMY THROUGH RIGHT INDIRECT INGUINAL HERNIAL SAC IN AFEBRILE CASES. SYPHILIS OF THE LIVER SIMULATING GALL-BLADDER PATHOLOGY

A SUGGESTION IN THE TECHNIC FOR CARCINOMA OF BREAST

I HAVE always been impressed by the swelling of the arm and forearm which often follows radical operations for carcinoma of the breast. Various schemes and procedures have been adapted for the purpose of obviating or minimizing the edema of the arm. Dr John B Murphy used to interpose a flap of pectoralis muscle between the axillary vessels and nerves and the skin, thus avoiding connective-tissue pressure upon the axillary vein, which in his opinion was one of the chief causes of postoperative edema. While the procedure had its merits from the standpoint of plastic, it was objectionable because the pectoralis muscle could harbor carcinoma cells and subsequently be a source of recurrence. After the closure of the wound he placed the patient's arm in extension, at right angle with the body, holding it in that position by a molded plaster-of-Paris cast for a period of two or three weeks. The cases operated upon by Dr John B Murphy had very little or no postoperative edema.

Editor's Note—In his later years it appears that Dr Murphy abandoned the use of the plaster cast in his breast cases. In the Surgical Clinics of Dr John B Murphy, Vol III, No 1, February, 1914 we find the following description of the dressings following a typical operation for carcinoma of the breast.

The arm will be dressed by the side of the body, the hand resting on the chest. A liberal dressing is applied, covering the

with bismuth subiodid powder and seal it with collodion gauze. The dressing is put on over this "

In my own work I have observed certain technical details which in a measure, assist in reducing the postoperative edema. In the first place, I carry the pectorohumeral branch of the incision high up 2 or 3 inches above the edge of the pectoralis major muscle thus placing the ultimate scar above the axillary space (Fig 117 a). In the last year I have employed in 3 cases a procedure which involves some of the Kondoleon principle. After finishing the operation along established lines, I dissected a good sized flap of fat overlying the biceps muscle, preserved a pedicle and turned the fat up placing it against the axillary space (Fig 117, b). In one case I have taken three pediculated strips of deltoid muscle and turned them down into the axillary space where they were each fastened by a catgut stitch. Pediculated strands of biceps could be equally well utilized for the purpose. The procedure is in reality a Kondoleon operation utilizing in addition the principle of Handley's lymphangioplastic operation suggested by him in 1908, using strands of muscle instead of silk strands. Strips of fascia lata could be equally well employed. The patients operated upon by the procedures outlined above had practically no edema of the arm after the operation.

ROUTINE APPENDECTOMY THROUGH RIGHT INDIRECT INGUINAL HERNIAL SAC IN AFEBRILE CASES

Nine years ago I saw a patient who had all the earmarks of a localized peritonitis in the right lower quadrant of the abdomen. While the case seemed to be fairly typical of an acute perforative appendicitis, I withheld my diagnosis on account of a coincident firm painful apparently strangulated hernia on the same side. The patient a female was operated upon, and the pathology was that of a perforated gangrenous appendix, strangulated in a femoral hernial sac. I removed the appendix, utilized the hernial sac as a drainage-tube by stitching it to the skin, and the patient made an uneventful recovery. Since that time I have had several cases in which the appendix was

breast and shoulder and reaching up on to the neck. A large pad is placed in the axilla. We always remove the iodine with

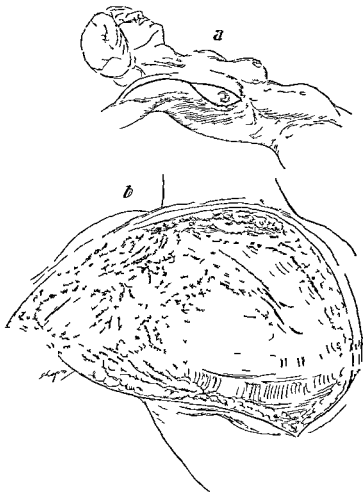


Fig 117—*a* Long high incision *b* pedunculated flap of fat sutured over axillary vessel

which the skin is painted before the operation is begun with alcohol to prevent an iodine dermatitis, then dust the wound

series of 50 cases at least 30 per cent showed evidence of a pathologic appendix. All his cases made an uneventful recovery. He does not advocate removal of an acute appendix through this route. If infection is present, as it happened in 2 of his cases, he suggests that a stab-wound be made in the abdomen by thrusting a curved forceps through the hernial sac and pressing it against the abdominal wall, opposite the point intended for drainage.

In my cases I have observed a good deal of pathology, and in several cases I have found either a subacute or acute appendix when it was scarcely suspected. The reason why these hernias were prompted to come to an operation was, in all probability, the sudden and rather severe pain in the region of the hernia, which was necessarily ascribed to it.

In removing the appendix through a hernial sac I believe that two steps in technic of routine appendectomy, which might otherwise be eliminated, should be observed here, namely, the carbolicizing of the stump and the inversion of same, both of which will insure greater asepsis. The procedure has a limited application and its practice should be justified by definite pathology, ease of access and operative skill.

SYPHILIS OF THE LIVER SIMULATING GALL-BLADDER PATHOLOGY

In 1912 I reported an error in diagnosis in which a strikingly typical case of gall stones proved to be multiple gummata of the liver.¹ I was much relieved when I found myself in the excellent company of eminent clinicians who made and confessed in print the same error. Syphilis of the liver so closely mimics acute gall bladder pathology that the error is quite excusable.

The history of the patient under observation was that of a woman aged twenty seven who complained of upper abdominal distress paroxysmal in character, for about three years. The attacks were severe in character, occasionally associated with epigastric distress, irradiating toward the right costal arch,

¹ Jour Amer Med Assoc, 1912 p 681

very close to the base of the sac, and I removed it. In operating upon hernias at the Cook County Hospital, where the number has been very abundant, especially since the establishment of the military draft, I have had occasion to observe, in rapid succession, a good many cases of fibrous patches in the hernial sac. People who have a hernia occasionally experience pain in the region of the corresponding groin. Some discontinue their work for a few hours, or even a day or two, and then return to work continuing to experience pain in the same region for a few days thereafter. The pain is purely *local* and should be distinguished from the pain of a strangulated hernia which, early in the condition, gives diffuse abdominal pains. In addition to this type, I believe that some painful hernias are due to an adjacent pathologic appendix. I base my assumption upon the extensive adhesions running from the appendix and caput coli to and into the hernial sac, which I have been able to observe, especially in the last eighteen months since I commenced to make a special search for this type of pathology.

I have removed a number of appendices through a right hernial sac. As a routine I do not search for the appendix in people over fifty, in patients where the procedure must necessarily be short, or in strangulated hernias. I generally introduce a Barrett, rubber tipped forceps through the open hernial sac, and if I can grasp the cecum without effort or trauma I deliver the cecum and appendix. If on the other hand, the delivery of the appendix requires effort or trauma I generally abandon the attempt. If there is a distinct history of recurrent appendicitis in such a case, I do an appendectomy through a separate muscle-splitting incision.

In none of the afebrile cases in which the appendix was removed, as a routine, through the hernial sac, was the post operative course of the cases modified or compromised by this procedure. A routine appendectomy in cases of herniotomy under local anesthesia is not desirable.

Dr. George de Tarnowsky, staff surgeon of the Cook County Hospital, now in the U. S. Army in France, was the first to suggest routine appendectomy through the hernial sac.¹ In his

¹ Jour. Amer. Med. Assoc., lrv, p. 1548

CLINIC OF DR BENJAMIN F DAVIS

PRESBYTERIAN HOSPITAL

WINGED SCAPULA—SERRATUS MAGNUS PALSY

Summary Presentat on of 2 cases—causes of serratus paralysis—the diagnosis treatment—palliative in the majority of instances operative cure attempted in selected cases by neuroplasty costoscaphular suture or muscle transplantat on

THE condition which we are about to discuss is one which is met with not infrequently in clinical work in the majority of instances it either yields spontaneously or functional restoration occurs through the vicarious activity of other muscles so that the lesion requires active treatment in but a relatively small percentage of cases

The first patient is a girl nineteen years of age who gives the following history About two weeks ago she fell down a flight of stairs striking on her right shoulder She noticed nothing more than slight soreness about the shoulder and inability to raise the right arm from the side beyond an angle of about 45 degrees The soreness has now largely disappeared but she is still unable to raise her arm

Upon examination we find the young woman well nourished and in good general health There are no abnormalities other than those discoverable upon examination about the right shoulder We find that she cannot raise the arm as before stated but there is no restriction to passive motion The deltoid appears to contract normally as does the trapezius The scapula however flares out from the plane of the back at about an angle of 45 degrees and the inferior angle of the scapula is rotated toward the midline The examining fingers can be passed very easily beneath the scapula so that nearly the whole of its anterior surface can be easily palpated Owing to

not necessarily related to food taking. She was often nauseated, but never vomited. The attacks recurred every three to four weeks and required opiates at times. She did not know whether or not she had a rise of temperature during the attacks. The examination revealed definite epigastric distress on pressure and marked tenderness on perpendicular percussion below the right costal arch. The examination of stomach contents showed no retention of food after seven hours; the chemistry of the gastric contents ranging within normal limits.

The blood picture showed a moderate secondary anemia. The x-ray showed a slight distortion of the duodenal cap; the roentgenologist concluding that it was probably due to pengastric adhesions.

In the last ten years I have observed a symptom which is always present in acute gall bladder pathology, particularly when it concerns the cystic duct. Every case of impaction of stone or stones in cystic duct or edema of same is associated at the height of the attack with a very definite respiratory embarrassment. The patients complain of difficulty in catching their breath. This symptom is not present in any other acute upper abdominal condition with which cholecystitis may be confused. It was absent in this case.

The diagnosis of various physicians was either gastric or duodenal ulcer or gall stones. An exploratory operation revealed a normal stomach and duodenum. The gall bladder was normal except for a few adhesions toward its neck. The liver showed marked lobulations separated by thick firm connective tissue. The surface of the larger lobulations showed grayish scars characteristic of syphilitic hepatitis. The case showed the two types so well described by H. C. McNeil,¹ namely, the lobular cirrhosis and the syphilitic perihepatitis. After the operation I have learned that the patient was married twice. The first husband had syphilis and she had definite knowledge that she had contracted it. Both she and her husband were inadequately treated for a short period of time. The present husband also had syphilis but he was very adequately treated.

¹ Interstate Med. Jour., vol. XXV, 1917, p. 685.

approximately a right angle to the coronal plane when the arms are extended anteriorly or abducted the condition is usually associated with inability to raise the arm on the affected side above or even to the level of the shoulder although the patient may be able to throw the arm up above the head and to maintain it there once the position is attained The condition may be unilateral or bilateral The immediate cause is paralysis sometimes involving only the upper digitations of the serratus magnus the paralysis may be limited to the serratus or may be associated with paralysis of other muscles particularly the lower third of the trapezius The causes of the paralysis of the serratus magnus may be considered under several headings

1 Trauma to the long thoracic nerve by punctured or incised wounds or during extensive dissections in the axilla by blows on the root of the neck or pressure incident to carrying heavy loads on the shoulder by pressure on the nerve due to its being caught between the coracoid process and first rib in excessive forward rotation of the shoulder or by the repeated or long continued contraction of the scalenus medius as when the arms are repeatedly extended above the head against a heavy load Repeated contractions of the scalenus medius may affect the nerve because in a part of its course the nerve passes through the substance of this muscle

2 Infectious or toxic neuritis of the long thoracic due to diphtheria so called la grippe rheumatism anterior poliomyelitis has also been reported as a cause

3 Hysteric A few cases have been described in which it was suspected that the lesion was purely functional although in the only instance which I have found in which details were given it was impossible to rule out the possible influence of coincident or preceding infectious disease

4 Systemic disease progressive muscular dystrophy particularly of the juvenile type It is in patients with this disease that the most marked instances of winged scapula appear Here of course paralysis is not limited to the serratus magnus but always involves other muscles about the shoulder joint in proportions varying greatly in different cases

the internal rotation of the inferior angle the line of the spine of the scapula is directed upward and inward rather than more or less horizontally in comparison with the normal side, and the vertebral angle of the scapula is tilted upward toward the root of the neck. When the patient attempts to raise her arm the scapula flares out from the back at approximately a right angle, and the greater the effort made to extend the arm the more pronounced does this displacement become.

We have here a typical case of winged scapula, in this instance resulting merely from a fall on the shoulder. Before discussing the pathology of this lesion I shall present this second case, in which the etiology is entirely different, and which represents, in contrast to the first, a type of case in which nothing but operative treatment can be expected to be of any service.

This young man is twenty-one years of age. In addition to marked flaring of both scapulæ he presents marked wasting of all the muscles of the shoulder girdle, of the neck, and of the trunk. He cannot raise himself to a sitting posture from a recumbent position. The deltoid muscles, in contrast with the other muscles of the shoulder girdle, while atrophic in their anterior and posterior portions appear hypertrophic in their medial portions. The masseter muscles also appear larger than one would expect to find them. The patient's chief complaint is that he cannot raise his arm above the level of his shoulder. It was because of this partial loss of function that he lost his position on the farm where he had been working.

This is evidently a case of progressive muscular dystrophy, and since according to the patient's story, he has been in his present condition for over two years it appears that the disease now is in a semiquiescent state.

With these two cases before you I shall discuss briefly the general clinical and pathologic features of winged scapula. It will be necessary to recapitulate a few of the points which have already been mentioned, but I shall try not to enlarge on them more than is necessary.

By "winged scapula" we understand that condition in which the inferior angle of the scapula flares out from the body at

renders radical surgical intervention unjustifiable in the great majority of instances. Only occasionally a case may be presented in which the disease is very indolent or even seems to have ceased its progress, and in which the involvement of other muscles, particularly the deltoid is but slight—these cases are fit for radical surgical intervention. Second, those cases in which winged scapula results from sectioning, rarely contusion, of the long thoracic nerve. As has been stated, in 90 per cent of traumatic cases though paralysis of the serratus magnus and hence deformity may persist, still functional recovery occurs through the vicarious activity of neighboring muscles. In 10 per cent deformity and loss of function are permanent unless corrected by treatment. In the vast majority of cases of winged scapula, therefore, treatment should be expectant. For the small minority there are two lines of treatment open. First, palliative by the use of orthopedic appliances, second operative. Of the use of orthopedic appliances there is little to be said. They may be fairly satisfactory, but tend to be heavy, and because of the necessity for frequent repair and removal too expensive for the average patient. The best and simplest appliance is one which is built upon the principle of the figure of 8 bandage for the shoulder. Not much is to be expected from this, however, because the mere correction of the deformity without definite fixation of the scapula can in no way compensate for the loss of power in the serratus.

For the operative treatment a number of procedures have been proposed. They may be classified under three general headings (1) Neuroplasty (2) scapula fixation, (3) muscle transplantation.

Neuroplasty—This procedure was suggested by Skillern several years ago, but has never been carried out. It is thought to be suitable for those cases in which the long thoracic has been cut or contused, and consists in anastomosing the distal end of the long thoracic with the proximal end of the short subscapular nerve. This to be done in case anastomosis between the proximal and distal ends of the long thoracic itself should prove to be impossible. The object of this operation is to restore to the

The diagnosis is made upon the history and the results of physical examination. The patient will state that following an injury in the shoulder region, an acute infectious disease, or coming on more insidiously in conjunction with weakness of other muscles, he found that he could not bring the arm above the level of the shoulder. There is frequently no complaint of pain and the patient may not be aware that his scapula does not move in its normal plane. On examination with the arm hanging at the side one notes that the vertebral border of the scapula and particularly the inferior angle tends to approach the midline of the back. The examining fingers may easily be slipped under the scapula and the scapula be raised from the chest wall. In old cases in subjects who are not too obese palpation may reveal marked atrophy of the lower digitations of the serratus magnus. When the patient extends the arm the inferior angle of the scapula flares out from the back and may even approach or overlap the midline posteriorly. The arms cannot be extended above the level of the shoulder, and usually cannot be extended to that degree unless the patient throws them up by a swinging motion transmitted from the trunk.

The prognosis depends primarily upon the etiology. Winged scapula occurring in progressive muscular dystrophy never disappears spontaneously. Winged scapula occurring as a result of section of the long thoracic nerve is usually permanent though in 90 per cent of the cases functional use of the extremity is regained through the vicarious activity of the muscles of the shoulder remaining after loss of the serratus magnus. In winged scapula occurring from other causes there is almost always complete restoration of anatomic and functional integrity without special treatment though occasionally severe contusions of the long thoracic nerve may result in permanent loss of function.

Treatment.—Since the majority of cases heal spontaneously,

— treat

ressive

ormity

and loss of function are permanent, still either the general condition of the patient or the rapid progress of the disease, or both,

As the case failed to improve with long-continued, patient, palliative treatment, the following operation was performed. Through a long U shaped incision in the anterior axillary fold, with the convexity of the incision looking forward and downward, the sternal portion of the pectoralis major was exposed and separated from the clavicular portion and from its insertion in the humerus. With the scapula well forward the severed pectoralis was then implanted into the serratus magnus, spreading the implanted muscle out so that it was brought into contact with five or six digitations of the serratus. The result of this operation was a marked increase in functional capacity of the arm, though not full recovery, and disappearance of the deformity. Four years later Katzenstein published a modification of Tubby's operation which consisted in the suture of the pectoralis major to the inferior angle and anterior inferior border of the scapula rather than to the paralyzed serratus magnus and this modification has been adopted by most subsequent operators, who have followed the method of muscle transplantation in the treatment of winged scapula. This appears to be a definite improvement over the Tubby method of suture of the paralyzed serratus. It is generally recognized that paralyzed muscles and the tendons of paralyzed muscles offer poor anchorage for transplanted muscular insertions.

Various attempts have been made to fix the scapula by cutting off its inferior angle freeing the subscapularis and infraspinatus muscles and stitching them to the fascia of the back, but without improving the patient's condition. Such an operation was performed by me two years ago on the second case which is presented this morning and while the patient says that he is no worse off than he was before still the converse is also true.

On the basis of the preceding discussion we shall tell this girl that she may expect complete return of function and disappearance of deformity in the course of the next few months. It is probable that her lesion is the result of contusion of the long thoracic by pressure between the coracoid process of the scapula and the first rib due to the excessive forward rotation of her shoulder incident to her fall down the stairway.

serratus magnus its normal nerve supply. This appears to be the ideal operation for a certain type of case, though technical difficulties, for instance that of approach to the field of operation, suggest themselves.

Scapula Fixation—This was first carried out by von Eiselsberg, who in 1898 reported two different operations for the cure of winged scapula in selected cases of progressive muscular dystrophy. Neither was particularly successful. The first consisted in the suture of the vertebral border of the scapula to the ribs. In this instance postoperative pain was intense and persisted far into convalescence, its severity was so great as to deter von Eiselsberg from advising the operation in other cases. In fact, he was forced to remove the silver wire sutures from this first case before healing was completed. His second method consisted in the osteoplastic suture of the inferior angle of one scapula to the corresponding angle of the opposite scapula. The results following this procedure were not satisfactory. The downward and backward displacement of the shoulders which developed because of the operation tended to occlude the space between the first rib and clavicle with serious pressure on the axillary structures. To relieve this condition a second operation was performed which consisted in lengthening the clavicle, and was successful, but the final condition of the patient was not such as would encourage the further use of the operation. In 1912 Menciére again took up the question of costoscapsular suture. He found that after careful subperiosteal exposure of three or four ribs the vertebral border of the scapula could be anchored to them without causing the patient the least subsequent pain. Menciére believed that von Eiselsberg must have included the intercostal nerves in his sutures thus accounting for the stormy convalescence of his patient. Menciére considers the subperiosteal suture of the scapula to the ribs the operation of choice in cases of winged scapula due to progressive muscular dystrophy in which an operation is justifiable.

Muscle Transplantation—Tubby in 1904 reported the case of a girl, seven years of age, who had paralysis of the serratus magnus—hence winged scapula—as a result of infantile paralysis.

CLINIC OF DR WILLIAM HESSERT

ST JOSEPH'S HOSPITAL

UNUNITED FRACTURE OF NECK OF FEMUR—TREATMENT BY BONE TRANSPLANTATION

Summary Diagnosis—fracture of neck of femur not necessarily a lesion of the aged only—functional results following fracture poor in 90 per cent of cases technic of bone grafting results in demonstrated case six months after operation

THE history of this case is as follows

This patient a man of forty was injured about two months ago by falling on a slippery sidewalk landing on his hip. The injury was immediately disabling and he was brought home and put to bed where he remained for six weeks. During those six weeks he was treated by his family physician but apparently a diagnosis of fracture was not made. He was simply kept in bed and nothing further was done. After six weeks he got out of bed and went about on crutches. He was repeatedly assured that he had no fracture although the clinical signs of fracture were obvious. In other words when he came under our observation a few days ago he was unable to walk except by the aid of crutches and he was suffering a great deal of pain in the right hip and in the knee. Measurement of the leg showed about $1\frac{1}{2}$ inches of shortening. There was eversion of the foot and functional disability and it was easy to make a clinical diagnosis of fracture of the neck of the femur. The x ray picture which was taken shows a fracture of the neck of the femur which probably at the time it was sustained was one of the base of the neck—not subcapitellar but a fracture at the base (Fig 118). In the last two months considerable absorption of the neck has taken place so that at the present time the x ray picture shows an osteoporosis of the head and neck a non union

Owing to the marked involvement of the other muscles of the shoulder girdle, muscle transplantation is out of the question in the second case and since this young man is able to earn his living fairly comfortably in his present condition, it is no doubt wisest to defer costocervical suture, which would be the technical procedure indicated here if active interference were to be undertaken, and advise the patient to be content with his present burden—it might easily be made heavier

the ligamentum teres it is quite likely that the loose fragment is going to be devoid of the necessary blood supply with the result that osteoporosis and absorption of the neck will occur. But the point I make is that clinically it is unnecessary to make a diagnosis as to whether the fracture is intracapsular or extracapsular. I do not believe there are any fractures extracapsular. Some of them may be partly extracapsular and partly intracapsular but it is unnecessary to differentiate them.

Now we used to teach that fractures of the neck of the femur were fractures of old people almost exclusively. That is not the case. We find many many fractures in people of adult life and middle life just as in this case—a man who is only about forty years of age so that fractures of the neck of the femur occur not only in the aged but they occur in the young. Of course the aged are more predisposed to fractures of the neck of the femur owing to the fragility of the bones and the absorption of lime salts which makes the bone less firm with the result that very often a lesser injury is followed by fracture. They occur also between the ages of thirty and forty and I have had one in the twenties so it is not a fracture of the aged alone. As a general proposition these fractures will occur in old people just as well as in the young and so the matter of non union does not depend upon age. It depends partly on the treatment and partly on the location of the fracture. In other words if the fracture is subcapitellar it is more liable to result in union than in non union. We will not have time to go into detail. There is just one more conclusion and that is these fractures of the hip are followed by a high percentage of disability. I think statistics show that at least 80 per cent are followed by more or less permanent disability. In only 20 per cent is the function any way fairly good. So you see under the most favorable circumstances the functional disability has been considerable.

Now the indication for operation here is the matter of non union. We have a man injured two months ago with non union and our experience teaches us that if he has non union in two months he will have non union in two years. I have a

with considerable absorption of the neck of the femur. The trochanters have slipped in an upward direction until the upper margin of the trochanter lies almost opposite the upper lip of the acetabulum. The x ray confirms our diagnosis of fracture of the neck of the femur, and it is quite unnecessary in the clinical diagnosis to try to determine whether it is an intracapsular or extracapsular fracture. It does not make any difference for

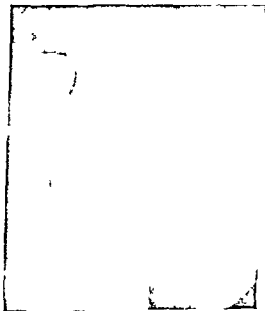


Fig. 118—Fracture of neck of femur of two months standing. No union, with $1\frac{1}{2}$ inches shortening causing great pain and total disability.

practical purposes whether the old differentiation is maintained. All we are interested in is whether it is a fracture at the base of the neck or at the head. Fractures of the head are rather more favorable because there will be less absorption of the neck and less likelihood of a non union than in this case where the fracture occurs at the base. In fractures of the neck of the femur owing to the very limited blood-supply the supply coming mostly through

we will hold the sartorius to the outer side. Now we have exposed the capsule of the hip-joint. I will palpate with forceps. Here is the anterior inferior spine of the ilium and to the outer side is the capsule. Usually considerable bleeding is encountered when the capsule is opened. There is the rim of the acetabulum. Finally now we come right down to the head of the bone. We will enlarge the opening so as to get free exposure. Now with a knife we proceed to open the capsule. We open it as widely as we can because we want to expose it. We will not be particularly solicitous about our opening here because we do not expect to sew it up again. Now we have the fracture exposed. It seems as though there were pieces of membrane as a veil between the two fragments. The fractured surface of the upper part of the neck is bound downward and in between this greater fragment and the lesser fragment seems to be a piece of membranous tissue which I have to cut away before I can expose the other fragment. I am now cutting away this membranous veil and when I have finished the fracture will be much better exposed. Now you can begin to see it (Fig 119 2). There is fibrous tissue interposed between the fragments. I can get a chisel in now between the fragments to pry them apart. The doctor asks me if there is any way of limiting that formation of fibrous tissue between the fragments in treating the fracture primarily. No there is not. In all probability the man would never get a union no matter what we did.

Now I think I have succeeded in getting the ends of the bone freshened sufficiently so that we can make traction and adduction. It is very essential in these cases to correct the eversion wherever it occurs. Now we must make our incision over the trochanter (Fig 119 1 B). After having incised the periosteum we will lift it aside so as to leave the bone exposed. Here is the point where we are going to drill our hole—about $1\frac{1}{4}$ inches below the upper margin of the greater trochanter. Now with the electric drill we will drill a hole into the trochanter and head of the bone. Here is one of the most important steps in the operation the placing of the drill hole. It has to be so placed

man under observation now whom I operated two months ago for non union that had been present two years. He had the same type of disability pain in the hip and pain in the knee so that the indication here is absolute namely, to put in some sort of fixation. We have gotten away from all sorts of metallic splints screws nails and spikes because it has been shown by experience that a foreign body in the shape of metal is not conducive to good bony union. I have used spikes and I have had to take them out. The only thing to use is an autogenous bone-graft from the same individual a peg made and driven into the previously prepared hip.

A brief resume of what we propose to do. In the first place we are going to make an incision on the inner side of the sartorius muscle starting a little below the anterior superior spine of the ilium drawing the sartorius to one side and rectus femoris to the other exposing the hip-joint and exposing the fracture. Then we will freshen the ends of the bone. After the fracture has been exposed we will make an incision over the trochanter a few inches long and with the electrically driven drill bore a hole through the trochanter and neck and into the head. After doing that we will expose the left tibia and take a graft 3 inches long from the left tibia and drive it into this previously prepared drill hole in the right hip. I do not believe it will be necessary to remove the sharp corners and edges of the graft. If there is not too much pressure it is not necessary to make it round. That being done the wound is sewed up and a plaster body cast put on. No extension is used. This cast is kept on for three months.

OPERATION

April 8 1918. We will start our incision on the inner side of the sartorius (Fig 119 1 A). We will do this operation strictly according to the teaching of Lane. Nothing that touches the hand should go into the wound. It must be absolutely a matter of instrumentation. That is absolutely essential in the prevention of infection. We must not touch anything with the hands that goes into the wound as far as it is possible to do so. Of course absolute asepsis is a necessity in bone work. Now

that when I drill through the upper end of the femur through the trochanter I will strike the neck and go into the head

Now we will make a long elliptical incision over the tibia and we will arrange our flap so that the skin incision will not lie right over the denuded bone. We will cut through the periosteum at the crest of the tibia and scrape the periosteum back, because we do not want any periosteum on this graft. We want the bone denuded of its periosteum because if we had a lot of fibrous tissue adherent to the bones it would defeat our purpose. It would cover up the osteoblasts and prevent union of the graft. Now I have estimated that we will need a piece of bone about 3 inches long. With the calipers we will lay off the necessary space. In applying the saw to the crest of the tibia you want to apply it as though you were going to cut from right to left. If you apply it in the opposite direction it is liable to get mixed up with the muscle and cause trouble. We will taper the end of the graft a little with the bone cutting forceps.

Now we have driven the graft in place and we are ready to close up (Fig 119 3). We will sew up the soft parts with catgut and the skin with silkworm and put on a plaster of Paris spica holding the leg in abduction. This cast will be left on about six weeks and then a new one will be applied which will be kept on for six weeks more. The patient will not be permitted to put weight on the leg for from four to six months but he will be around on crutches in the meantime (Fig 120).

Postoperative History—Wound healing was uneventful. The first body cast was kept in place for six weeks and it was not until then that the two subcutaneous silkworm gut sutures were removed. The sutures had not produced the slightest

Fig 119—Bone peg for repair of ununited part of femur. 1 Incisions. a The anterior incision from 3 to 4 inches in length along the inner border of the sartorius muscle. b the 2 inch incision over the trochanter. 2 the muscles are retracted the capsule has been incised and the fracture brought to view.

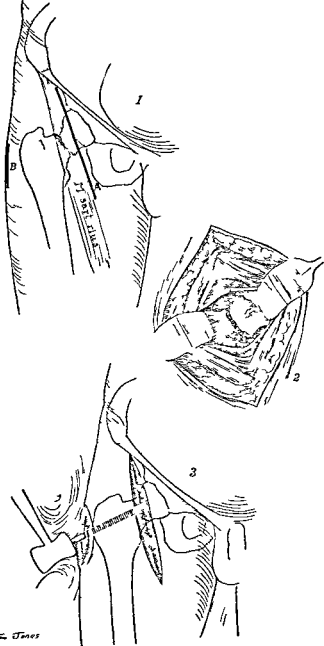


Fig 119

CLINIC OF DR. EDWARD L. MOORHEAD

MERCY HOSPITAL

PROLAPSE OF THE UTERUS IN A VIRGIN EIGHTEEN YEARS OLD

Summary Examination of patient—diagnosis—degrees of prolapse of uterus—etiology—treatment—the three cardinal principles—technical of operation in present case

THIS young lady Miss M. B. was brought to me last week by her mother for examination on account of a supposed swelling of the external genitalia. She gives the following history: Age eighteen years, single, born in Russia. Has been in this country three years. No special sickness during childhood, but was subject to the poor living conditions of her class in Russia. Began working when twelve years of age and work was at times quite hard for her to perform. Menstruation began when fifteen years of age, regular, but quantity small. The girl states that this swelling has been present for one year and that at night when she lays in bed it disappears to a certain extent, but upon arising in the morning and walking about it reappears and of late has inconvenienced her so much that she spoke to her mother about it for the first time just previous to their consulting me.

Upon examination the patient is found to be fairly well nourished, about 5 feet 3 inches in height and weighs 98 pounds. Color is somewhat pale. Heart and lungs negative. Abdomen rather flat and some tenderness over left side. External genitalia. The uterus protrudes about 2 inches beyond the vaginal outlet (Fig. 121). The anterior vaginal wall is involved to a small extent in the prolapse, but the posterior vaginal wall is not. Upon replacing the prolapsed uterus there is found by bimanual examination a mass on the left side about the size of an orange, semisolid in consistency and but slightly movable.

irritation. A new body cast was at once applied and remained in place for another six weeks. During this time the patient was allowed up using crutches. At the end of three months the cast was left off, and the patient walked with crutches, but no weight was borne on the fractured leg for another month. After that time, it being evident that union was firm, he began

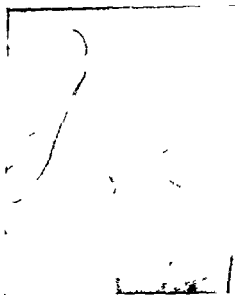


Fig. 120—Fracture of femur neck after operation showing bone peg in place. The obliquity of the neck has been restored possibly even over corrected. Later measurement showed no shortening. The bone peg might have had more of an upward slant. Good judgment must be exercised to give the drill hole the proper direction. Without the anterior incision as a guide the operator might miss the head entirely.

to bear more and more weight on the leg and massage and baths soon restored motion at the hip. Six months after the operation the patient was able to walk without a limp and motion at the hip was 90 per cent restored and not painful. There was no shortening demonstrable. There was no eversion of the foot and the patient was able to climb stairs easily. The tibia from which the graft was taken caused no trouble at any time.

CLINIC OF DR. EDWARD L. MOORHEAD

MERCY HOSPITAL

PROLAPSE OF THE UTERUS IN A VIRGIN EIGHTEEN YEARS OLD

Summary Examination of patient—diagnosis degrees of prolapse of uterus—etiology treatment—the three cardinal principles technic of operation in present case

THIS young lady, Miss M. B., was brought to me last week by her mother for examination on account of a supposed swelling of the external genitalia. She gives the following history: Age eighteen years, single, born in Russia. Has been in this country three years. No special sickness during childhood, but was subject to the poor living conditions of her class in Russia. Began working when twelve years of age and work was at times quite hard for her to perform. Menstruation began when fifteen years of age, regular, but quantity small. The girl states that this swelling has been present for one year, and that at night, when she lays in bed, it disappears to a certain extent, but upon arising in the morning and walking about, it reappears, and of late has inconvenienced her so much that she spoke to her mother about it for the first time just previous to their consulting me.

Upon examination, the patient is found to be fairly well nourished, about 5 feet 3 inches in height and weighs 98 pounds. Color is somewhat pale. Heart and lungs negative. Abdomen rather flat and some tenderness over left side. External genitalia. The uterus protrudes about 2 inches beyond the vaginal outlet (Fig. 121). The anterior vaginal wall is involved to a small extent in the prolapse, but the posterior vaginal wall is not. Upon replacing the prolapsed uterus there is found, by bimanual examination, a mass on the left side about the size of an orange, semisolid in consistency and but slightly movable.

The diagnosis is quite evident complete prolapse of the uterus with probably a parovarian cyst or an adherent ovarian cyst in the left side

By prolapse of the uterus is meant a sinking or falling of that organ into the pelvic cavity and even outside of the vulva. The popular name for this condition is falling of the womb which



Fig. 121.—Prolapse of uterus; cervix projects about 2 in. hes.

may mean any of the various degrees of the displacement. The term is misleading as a prolapse of the uterus is always associated with eversion of other structures as the vaginal wall, the bladder or the rectum. For practical purposes prolapse is described as occurring in one of three degrees:

- 1 The cervix touches the floor of the pelvis
- 2 The cervix reaches the vaginal introitu

3 The cervix passes the vaginal introitus and more or less of the whole body of the uterus is extruded beyond the vulva

In prolapsus of the first degree the cervix touches the floor of the pelvis the fundus uteri is proportionately below its normal level and the uterine axis inclines slightly backward The suspensory ligaments of the uterus chiefly the broad ligaments are more or less relaxed otherwise this sinking of the organ could not take place Neither the bladder the rectum nor the vagina is necessarily involved in this first degree of prolapsus In the second degree the external os approaches the vaginal orifice, the body of the uterus is retroverted and lies in the sacral excavation the suspensory ligaments are proportionately relaxed and drawn down and usually the anterior vaginal wall and the posterior wall of the bladder accompany if they do not precede the prolapse of the uterus The posterior vaginal wall and the rectum are as yet usually in their normal position In the third degree the cervix protrudes from the vulva more or less, even to the extent of the entire extrusion of the uterus The anterior vaginal wall and the posterior wall of the bladder down to the meatus urinarius protrude from the pelvic cavity and in a very large proportion of cases the posterior vaginal wall and the anterior wall of the rectum are prolapsed to the same extent The sound passed into the bladder through the urethra and the finger introduced into the rectum will at their lowest points be on a level with the external os showing a complete prolapsus of the anterior and posterior vaginal walls with the corresponding walls of the bladder and the rectum

Usually in prolapsus uteri of the second and third degree the organ is retroverted or retroflexed This is due to the tendency of the organ to drop backward when its fundus falls below the excavation of the sacrum In consequence of the downward traction of the adherent vaginal walls and a certain amount of pathologic hypertrophy of the supravaginal portion of the cervix a uterus prolapsed in the third degree is almost always elongated frequently measuring from 4 to 6 inches in length

There are a few instances on record in which an anteflexed

or retroflexed uterus of perfectly normal size was found prolapsed outside the vaginal orifice surrounded by the completely prolapsed vaginal walls with bladder and rectum. These cases occurred in virgins of advanced years in whom the natural relaxation of the pelvic connective tissue permitted a vaginal and uterine prolapse.

The causes usually given for the production of prolapse of the uterus are: First a heavy uterus dragging down on its suspensory ligaments and gradually sinking deeper and deeper into the pelvic cavity until it finally draws down with it the anterior vaginal wall with the bladder and then the posterior vaginal wall with the rectum. Second prolapse of the anterior vaginal wall with the bladder dragging down the uterus finally prolapse of the posterior vaginal wall with the rectum. In the first instance it is the heavy uterus which primarily causes the prolapsus; in the second it is the relaxed and descending vaginal walls which drag down after them the heavy uterus.

Indirect causes of prolapsus uteri are lacerations and relaxation of the perineum and pelvic floor whereby prolapsus of the vaginal walls is facilitated; certain constantly acting influences which force down the abdominal viscera toward the pelvic roof such as dress, overwork, too much exercise in the erect position, constipation and overdistended bladder. One of the commonest causes of prolapsus uteri is too frequent and too rapidly repeated parturition.

In our case today we have this condition occurring in a virgin eighteen years of age and she states that it has existed for about one year. This is a very rare condition in one so young and the only cause to which we can attribute its production is hard work and heavy lifting at an early age and lack of proper nourishment.

Treatment—The operative treatment of prolapsus uteri must be based on three cardinal principles:

- 1 The diminution in size and weight of the uterus
- 2 The restoration of the tone of the uterine ligaments
- 3 The repair of the uterine supports, the vagina and perineum

neum

There have been many operations devised for this condition and their multiplicity is an evidence of their unreliability

Now in this patient we shall first do a high amputation of the cervix. A circular incision is made immediately above the cervix through the vaginal wall and the uterus is pulled downward with a tenaculum forceps. The vaginal wall is carefully dissected free and stripped off by gauze upon the finger being careful to direct the force of the separation toward the uterus thus avoiding injury to the bladder.

The amount of cervix we shall remove in this case is about $1\frac{1}{2}$ inches. The uterine vessels on each side of the cervix are now tied as high up as possible with catgut ligatures and the cervix amputated. The vaginal wall is now sutured first anteriorly and then posteriorly the sutures passing through first the vaginal wall then picking up the uterine tissue and then passing out through the mucosa of the cervical canal. I shall use three sutures anteriorly and the same posteriorly. Nothing will be done to the vagina or perineum in this case as you readily understand that it is unnecessary.

The abdomen will now be opened in the midline between the umbilicus and the pubis. On the left side there is a parovarian cyst about the size of an orange. The broad ligament is incised and the cyst enucleated and the opening in the broad ligament closed by continuous suture. The sacro uterine ligaments on either side are now picked up with forceps and I shall try to place two interrupted sutures through each one of them in such a manner that when tied the ligament will be folded upon itself thereby shortening it and elevating the uterus.

The round ligaments will be shortened by picking them up with a silk suture in either side about $1\frac{1}{2}$ inches from the uterus. This loop is held by forceps on either side. The fascia is incised about 1 inch from the margin of the abdominal incision at its lower angle and a sharp pointed artery forceps thrust through the fascia muscle and peritoneum. The loop holding the round ligament is grasped by this forceps and the round ligament pulled through the incision and sutured to the fascia. The other will be done in the same manner. The body of the

or retroflexed uterus of perfectly normal size was found prolapsed outside the vaginal orifice surrounded by the completely prolapsed vaginal walls with bladder and rectum. These cases occurred in virgins of advanced years in whom the natural relaxation of the pelvic connective tissue permitted a vaginal and uterine prolapse.

The causes usually given for the production of prolapse of the uterus are First a heavy uterus dragging down on its suspensory ligament, and gradually sinking deeper and deeper into the pelvic cavity until it finally draw down with it the anterior vaginal wall with the bladder and then the posterior vaginal wall with the rectum. Second prolapse of the anterior vaginal wall with the bladder dragging down the uterus finally prolapse of the posterior vaginal wall with the rectum. In the first instance it is the heavy uterus which primarily causes the prolapsus in the second it is the relaxed and descending vaginal walls which drag down after them the heavy uterus.

Indirect causes of prolapsus uteri are lacerations and relaxation of the perineum and pelvic floor whereby prolapsus of the vaginal walls is facilitated certain constantly acting influences which force down the abdominal viscera toward the pelvic roof such as dress, overwork, too much exercise in the erect position, constipation and overdistended bladder. One of the commonest causes of prolapsus uteri is too frequent and too rapidly repeated parturition.

In our case today we have this condition occurring in a virgin eighteen years of age and she states that it has existed for about one year. This is a very rare condition in one so young and the only cause to which we can attribute its production is hard work and heavy lifting at an early age and lack of proper nourishment.

Treatment.—The operative treatment of prolapsus uteri must be based on three cardinal principles.

- 1 The diminution in size and weight of the uterus.
- 2 The restoration of the tone of the uterine ligaments.
- 3 The repair of the uterine support, the vagina and perineum

CONGENITAL INGUINAL HERNIA

Summary A baby eight weeks of age with a hernia which palliative treatment has failed to control—radical herniotomy

THIS little patient, Baby H, is eight weeks old. He was brought to me ten days ago for advice regarding an inguinal hernia on the right side. His parents stated that the hernia appeared shortly after his birth and that it has been gradually increasing in size. The family doctor had tried to retain the hernia by the application of a truss, but was unsuccessful. The child was then only about six and a half weeks old and I was adverse to any operative procedure if it could possibly be avoided and therefore advised the doctor to continue his efforts in the application of a truss and to try that plan of support made by the use of a skein of wool known as fingering. In this method the wool is divided at one end so that when placed around the body the cut ends of the skein can be passed through the loop forming a knot over the inguinal canal which acts as the pad of a truss. The cut ends are now passed under the perineum and tied to the transverse portion behind. This can be changed daily when the child is bathed and the mother or nurse can be instructed as to its proper application. It is a very good method of treating hernia in infants where the application of the ordinary truss is troublesome or difficult.

Yesterday they informed me that their efforts were unsuccessful that the hernia was becoming larger and insisted that something be done for the child.

Under these conditions there is no alternative except to operate and effect a radical cure of the hernia if possible, or at least obtain a result that will retain the hernia until the child is older and better able to stand a more protracted operation. At the present time you can readily understand it will be necessary for me to work quite rapidly as the anesthetic must be of short duration.

STRANGULATED INGUINAL HERNIA COMPLICATED BY ACUTE GANGRENOUS APPENDICITIS

Summary History and diagnosis—Andrews operation for the radical cure of hernia

THIS patient is a male aged fifty eight years. He gives a history of having had an inguinal hernia on the right side for a number of years. He has worn a truss and never had any difficulty in replacing and retaining the hernia. General health has always been good. Drinks moderately. No venereal history. Bowels regular. Appetite good. Occupation laborer. He says that last Friday evening he did not feel very well, that he had an uncomfortable feeling in the abdomen, was nauseated and did not eat any supper. During the night the pain increased and by Saturday morning it was severe and accompanied by vomiting. He was unable to retain anything in his stomach all day Saturday and Sunday. Bowels did not move Saturday or Sunday. The hernia came down early Saturday morning when the vomiting began, there was severe pain in it and he was unable to reduce it. A physician was called and attempted to reduce the hernia but failed and advised his removal to a hospital for operation.

Patient was admitted to Mercy Hospital Sunday afternoon at 3 o'clock, about thirty six hours after the onset. At that time his temperature was 102° F, pulse 120. He was nauseated and suffering from severe pain. The hernial protrusion was larger than a fist and irreducible.

Diagnosis, strangulated inguinal hernia.

He was immediately prepared for operation. Ether anesthesia. The operation which was performed in this case (Andrews operation) is the one I usually follow, as I believe it to be the best, because by it the buttress overlying the weak part of the abdominal wall is made up not merely of muscle but also of one of the strongest structures, the aponeurosis of the external oblique muscle.

The operative treatment of congenital inguinal hernia differs in no particular from other inguinal hernia except as to the sac. The isolation of the sac may be exceedingly difficult because of its exceeding thinness, and the spreading out of the structures of the cord over a large part of the sac. Anatomically, the difference between a congenital and acquired inguinal hernia is, that in the descent of the testis into the scrotum it is accompanied or preceded by an outgrowth of the peritoneum the processus vaginalis peritonei. This process becomes shut off first at the internal inguinal ring and then just above the testis, and finally the intervening portion, which remains as a fine cord like structure within the spermatic cord. In the congenital inguinal hernia the closure of this process has failed to take place either at the abdominal ring the testicular end or the intervening portion thereby leaving a complete hernial sac, which communicates above with the general peritoneal cavity.

The usual incision is made for inguinal hernia and I shall try to isolate the sac first at the external abdominal ring as the landmarks there will be better. Thus we are able to do and the structures of the cord are dissected from the sac. Upon opening the sac and exposing its contents there is found besides the intestine the appendix prolapsed with its mesentery. No attempt will be made to remove the appendix as time is a great factor in this special case. The contents of the hernial sac are now reduced and the sac may be dealt with in one of three ways. First by ligation at the internal inguinal ring everting and suturing the remainder. Second by ligation at the internal inguinal ring cut off and sutured at the testicular end, forming a new tunica vaginalis and removing the intervening portion. Third ligation at the internal inguinal ring and the dissecting away of the remaining portion as far as its attachment to the testis without constructing a new tunica vaginalis. The last method is followed in this case and the operation completed in the usual manner. There has been very little anesthetic used and the little fellow is in good condition and I believe the prognosis is good from an operative and curative standpoint.

each suture grasping on the upper side the anterior surface of the aponeurosis of the external oblique and on the other side the cut edge of the lower flap of the aponeurosis. When these sutures are tied the lower flap overlaps the upper throughout

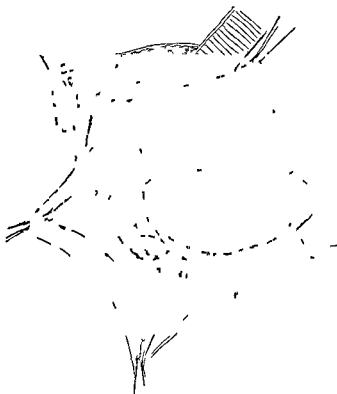


Fig. 123—Sac laid open disclosing strangulated bowel and gangrenous appendix.

its entire length. The skin was closed with interrupted silk-worm gut sutures. Usual dressing. The postoperative course of this case to date has been uneventful. The wound is perfectly clean. The external sutures will be removed on the tenth day.

The skin incision about $3\frac{1}{2}$ inches in length was made not quite parallel with Poupart's ligament but slightly vertical so as to be parallel with the fibers of the aponeurosis of the external oblique muscle. The aponeurosis of the external oblique muscle was then incised in the direction of its fibers through the external ring. The upper flap was not dissected away from the underlying internal oblique muscle the lower flap was retracted and the cord lifted away. By gauze dissection as much of Poupart's ligament was exposed as was necessary. The cremaster muscle and cremasteric fascia were now incised the cord lifted up and the sac isolated. In oblique inguinal hernia the sac is always to the inner side of the cord. In old hernia the sac is usually thickened and is recognized by its pale color. The sac was opened. In this case the bowel was strangulated dark in color and there was free fluid in the sac. Upon lifting up the first coil of intestine there came into view the gangrenous vermiform appendix (Fig 123). The bowel was treated by the application of hot compresses until the color improved the appendix was removed by ligation and inversion with a purse-string suture. The contents of the hernia were now reduced and the neck of the sac ligated high up with catgut by transfixion the redundant portion of the sac amputated and the stump allowed to slip back into the peritoneal cavity. The cord was now replaced in its bed and the closure made by sutures of kangaroo tendon. On the upper side each suture includes the aponeurosis of the external oblique and the united internal oblique and the transversalis muscle lower down the suture includes the aponeurosis of the external oblique and the conjoint tendon and further toward the median line the aponeurosis of the external oblique and the edge of the sheath of the rectus muscle. Upon the lower side all the sutures are inserted so as to take a firm bite on the shelving edge of Poupart's ligament. A sufficient number of sutures are taken so that when tied the entire inguinal canal is closed leaving at the lower angle enough room for the escape of the cord without strangulating it. The overlapping of the aponeurosis of the external oblique is now made by sutures of chromicized catgut.

INFANTILISM

Summary Demonstration of patient—the diagnosis—its definition etiology

I BRING this patient into clinic this morning, not because of the condition for which she sought relief upon admission to the hospital but because of the very interesting picture she presents. Mrs. A. R. is twenty six years old and enters the hospital because of a reddened painful swelling indurated and firm at the site of the right Bartholin gland. A history of vaginal discharge and burning on urination precedes the appearance of this condition by several days. Upon examination this tumor mass was found to be a Bartholinitis probably gonorrheal in origin. This condition was treated and now I bring the patient in that you may observe her.

As you see her body is apparently well formed and she walks without assistance (Fig. 124). By actual measurement she is 45 inches in height. Physical examination reveals a very small white woman apparently older in years than her size would indicate. The expression on the face is old and many of the teeth are missing. The scalp eyes and nose are negative. In the neck many small superficial lymph glands are palpable, but the thyroid cannot be made out. General examination is otherwise negative with the following exceptions. The body appears about the size of that of a girl eleven years old. The breasts are not developed. There is no axillary or pubic hair and the external genitalia are infantile in type. A very small rudimentary cervix is felt in good position upon vaginal examination and a rudimentary corpus above it.

The patient states that she has always been small for her age and has not grown any since she was fifteen years old. Menstruation has never appeared and though the patient has been married for seven years she has never become pregnant. She has never felt very strong and tires easily while at work. Family history negative. No other members of her family are so affected.

—that is the lower length of the body equals the upper length or, what is commoner, exceeds it only a little—the form of the pelvis is neither of the masculine nor feminine type, but infantile, and finally, the psyche remains behind in development. Such individuals show throughout no gross defect in intelligence, but their minds remain childish.

Important for the definition of infantilism are the following considerations, which serve to render precise the position of the ductless glandular system in the pathogenesis of infantilism. If the *infantilism* comes about through a standstill of the entire organism at a childish stage of development, then it is intelligible that also the sexual glands do not develop further. Up to the present however, we have not sufficiently considered that the sexual glands occupy a separate position in the ductless glandular system, in that though they function from early youth and influence the development of the organism yet they attain their complete maturity only at the age of puberty, the other ductless glands are already fully developed in the newborn. At the same time the remaining behind of the development of the sexual glands in infantilism is only a subordinate symptom of the entire clinical picture.

The case is shown only for the features it presents as the question of treatment involves not a cure of the condition but aims only to aid in substituting for the functions of some of the glands of internal secretion. By the use of this method we can hope to make the patient more comfortable and probably increase her strength so that she may more satisfactorily discharge the duties of her daily life.

Wassermann test is negative. Past history is negative for injuries or acute febrile diseases of childhood.

Our diagnosis is evident—a case of infantilism. This term is a rather uncertain one, but briefly we may define a pure infantilism as a standing still at the infantile stages of development considering especially the following factors: the genitalia



Fig. 174.—Case of infantilism. Note absence of the usual development of the female breasts.

and the *vita sexualis* remain undeveloped or develop demently and the same is true of the secondary sex characters: the involution of the lymphatic apparatus is deficient; the growth is deficient; ossification, that is, the appearance of the bone nuclei and the closure of the epiphyses, is delayed; and the childish dimensions of the body are retained wholly or in part.

CLINIC OF DR. G. L. McWHORTER

PRESBYTERIAN HOSPITAL

DIAGNOSIS OF FISTULA IN ANO

Summary Necessity of proctoscopic examination; technique of proctoscopy; importance of finding the internal mouth of the fistula— injection of methylene-blue solution as a guide.

FISTULA in ano though a common complication is often neglected for fear of a disagreeable result, incontinence, and for fear that operation may result in failure to cure. Tuttle has stated that less than 45 per cent. of fistulæ out of a series of 2196 cases treated were claimed to be cured. The reasons for the large percentage of failures are chiefly failure to find the internal opening, overlooked pockets or collaterals, failure to remove the predisposing cause, as for example a pocket in a sinus of Morgagni, hemorrhoids or a prolapse, and lastly neglect in dressings.

Fistula in ano may be complete or incomplete. In the complete type one opening is through the skin, adjacent organ or bowel. The other opening is in the mucosa of the rectum. In the incomplete or blind type the opening may be internal in the rectum or external on the skin. There are three distinct relations to the muscles: in the first the tract lies superficial; in the second it lies in the ischio-rectal fossa with the internal opening between the internal and external sphincters; in the third the internal opening lies above the internal sphincter. In this last relation while the internal opening may be higher in the rectum than the internal sphincter, yet in many cases the tract is superficial to the sphincter and consequently it is unnecessary to cut it. Where the tract extends high into the ischio-rectal fossa some source in the pelvis should be considered, such as inflammation of the pelvic organs and bones.

of the opening by observation especially after injecting methylene-blue solution. I had difficulty in introducing solutions into these sinuses until I used the Wheeler tip on the end of a syringe (Fig 125 b). This is of rubber, bluntly pointed, yet the very tip may be inserted into the smaller openings and, being slightly flexible, it follows the sinus while pressure is made to force solutions into the fistula. The broad part of the tip effectually fills the mouth of the tract. By carefully withdrawing the proctoscope, the one or more internal openings may be seen, and their positions located. Roentgenograms may be taken if desired. The importance of localizing these internal openings before operation and this very satisfactory manner of injecting the tract are emphasized.

The discovery of branches with multiple openings is practically impossible at the operation on account of the blood-stained field. The procedure of passing a probe through the tissues from the external opening until felt under the mucous membrane, then pushed through to complete the sinus, should be condemned, for following this method a blind internal opening is often left higher up or even on the opposite side of the bowel.

TECHNIC OF PROCTOSCOPY

The proctoscope most satisfactory for inspection is the 25 cm. length, having a large observation lumen. The Tuttle instrument which I am using has the stem for carrying the electric light in a groove external to the lumen (Fig 126). At the extreme end this small cylinder is closed by a flint glass bulb. Instruments are made in various sizes and lengths. An obturator is provided for introduction. Upon removing this, a glass window is inserted and connected with a hand bulb for inflation.

The patient is prepared for examination by a cathartic at night and by a thorough flushing of the colon in the morning. There should be no fluid in the sigmoid or rectum at examination. The preferable position for routine examination is the knee-chest. All waist bands are removed and clothing loosened. The thighs should be practically vertical, the chest in contact

The usual cause of fistula in ano is a periproctal abscess which has been neglected, and after breaking open has formed a fistula which rarely heals by itself. The infection may be pyemic or due to tuberculosis or syphilis. In syphilis it may follow ulceration of the rectum. Various authors report from a low to a high percentage of fistulae in ano due to tuberculosis. The tubercle bacilli may gain entrance from being swallowed by a

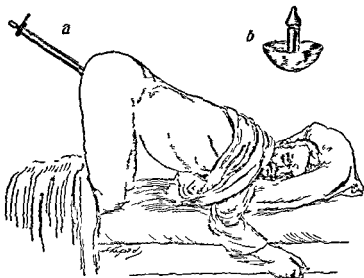


Fig 125.—a Knee-chest position for examination. The proctoscope is passed with the axis in line with the anal canal, and then its position changed to follow the rectum and sigmoid. b the Wheeler rubber tip which is attached to a syringe for injection of the fistulous tracts.

patient with pulmonary involvement or they may be derived from the food the rectal symptoms being the first to appear.

In order to locate the openings and tracts before operation the proctoscope is necessary and in order to rule out pelvic sources the use of bismuth, thorium potassium iodid or some other media with the Roentgen ray is advisable. I have found it especially valuable to proctoscope the patient and after examining the lower sigmoid and rectum to determine the position

with the examining table the head turned to one side with the face against a thin pillow and the arms extended. In this position the patient should be told to breathe through his mouth and to relax so as to produce as much of a lordosis as possible (Fig. 125 a). This position empties the pelvis of intestines relieves the pressure from adjoining organs on the rectum and permits the rectum to balloon out when air is allowed to enter the anus.

Before instrumentation always make a digital examination in order to determine abnormalities such as stricture or a new growth in the lower rectum and changes in the ischiorectal fossae. This not only gives one information of the terminal rectum but prevents blindly introducing an instrument and possibly injuring tissues. The instrument is lubricated carefully introduced with the axis directed at first downward and forward in the direction of the anal canal. After the end passes the sphincters into the rectum the obturator is removed and air is allowed to enter the rectum. It may be necessary to further distend the rectum in which case the window is inserted and the hand bulb used.

On examining the rectum the axis of the proctoscope is changed and directed upward then gradually changing to pass the pelvic brim the sigmoid is inspected. Crescentic folds or valves of Houston usually three in number are seen extending part way around the rectum. The middle valve is usually the most prominent and is located on the right anterior quadrant of the rectal wall usually just below the level of the pouch of Douglas. The inferior valve is about 3 cm. above the anal canal on the left posterior quadrant. The superior valve is in the same quadrant. There is usually a well developed valve or sphincter at the rectosigmoid juncture.

The sigmoid does not balloon out with the rectum and since the rectosigmoid juncture is usually on one side the rectum may seem to end in a blind pocket. This necessitates with drawing the proctoscope slightly and searching for the opening. Though the rectosigmoid juncture may be to the right or left, I have found it more frequently upon the left. The proctoscope

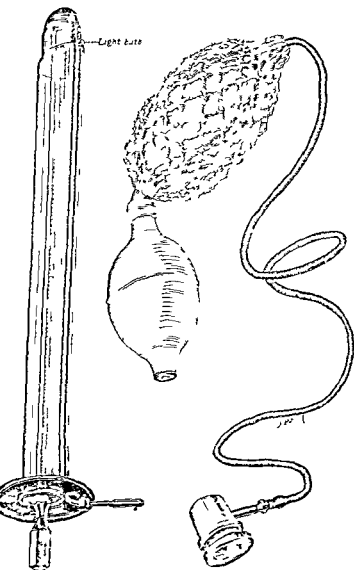


Fig. 126.—The proctoscope ready for insertion and hand bulb for inflation. Cautious inflation is practically free from danger and aids introduction of the instrument and observation.

CLINIC OF DR DANIEL N EISENDRATH

COOK COUNTY HOSPITAL

FRACTURES OF THE PATELLA

Summary A case of fracture of the patella with wide separation of the fragments—operation within forty eight hours after injury pathology and surgical anatomy of fractured patella advantage of early operation

THE case which I wish to present to you today is one of a laborer aged forty who entered the hospital after a fall upon the sidewalk which resulted in the fracture of his left patella. He was unable to walk immediately after the accident a symptom which I consider of great importance and which is due not so much to the fracture of the patella itself as to the tearing of the aponeurosis on either side of the patella. He entered the hospital with an enormous swelling of the knee-joint the result of an extensive extravasation of blood not only into the joint proper but also surrounding the fractured surfaces of the patella and the torn edges of the aponeurosis. It is of considerable interest in this case to note the fact that the patient had a fracture of the same patella thirteen years ago and was treated in this hospital for ten weeks by non-operative measures. Therefore we are dealing with a so-called refracture which is not infrequent in the case of this particular bone. Such a refracture is much less apt to occur in cases which have been operated upon because we make a special effort as we shall see later to prevent inversion of the periosteum between the fractured surfaces. I believe that the removal or lifting up of the periosteum covering the fractured surfaces and the suture of the torn aponeurosis are the two chief advantages of the operative treatment.

The examination today shows a wide separation of the two fragments into which the patella has been divided by the trans-

now is gradually withdrawn and at the same time the methylene-blue solution is injected into the external opening of the fistula if there is more than one opening the others are temporarily closed. The internal openings are located by the escape of the blue solution from them as the proctoscope is being withdrawn keeping the rectum and later the anal canal distended with air by use of the hand bulb. Blind internal tracts are located through a short proctoscope by means of a probe with the tip bent upon itself by inspection of the small papillæ and by expressing pus on pressure.

In the treatment of fistula in ano the general surgical principle rests upon the division of the tissue between the fistula and the anal canal. This converts the fistula into an open gutter which may heal by granulation from the bottom. It is rarely necessary to cut both sphincters and in these cases the conservative gradual division of the fistulous tracts as advocated by Albright should be considered. If necessary to cut the external sphincter in more than one place it should be done at a second operation. Care should be taken to cut through the sphincter muscle-fibers at right angles and not obliquely. The superficial fibers of the external sphincter run almost parallel fusing in the midline in front of and behind the anus but the deep thicker mass is circular. In horseshoe fistula with multiple openings an encircling cut is made in the skin and only one cut through the sphincter. If excision of a fistulous tract is practised it may be unnecessary to cut the muscle. Pelvic fistulæ should not be operated in this manner but treatment should be directed to the cause.

CLINIC OF DR DANIEL N EISENDRATH

COOK COUNTY HOSPITAL

FRACTURES OF THE PATELLA

Summary A case of fracture of the patella with wide separation of the fragments—operation within forty-eight hours after injury pathology and surgical anatomy of fractured patella advantage of early operation

THE case which I wish to present to you today is one of a laborer aged forty who entered the hospital after a fall upon the sidewalk which resulted in the fracture of his left patella. He was unable to walk immediately after the accident a symptom which I consider of great importance and which is due not so much to the fracture of the patella itself as to the tearing of the aponeurosis on either side of the patella. He entered the hospital with an enormous swelling of the knee joint the result of an extensive extravasation of blood not only into the joint proper but also surrounding the fractured surfaces of the patella and the torn edges of the aponeurosis. It is of considerable interest in this case to note the fact that the patient had a fracture of the same patella thirteen years ago and was treated in this hospital for ten weeks by non operative measures. Therefore we are dealing with a so called refracture which is not infrequent in the case of this particular bone. Such a refracture is much less apt to occur in cases which have been operated upon because we make a special effort as we shall see later to prevent inversion of the periosteum between the fractured surfaces. I believe that the removal or lifting up of the periosteum covering the fractured surfaces and the suture of the torn aponeurosis are the two chief advantages of the operative treatment.

The examination today shows a wide separation of the two fragments into which the patella has been divided by the trans-

verse line of fracture. The diastasis is wide enough to admit three fingers easily. The x-ray confirms the transverse nature

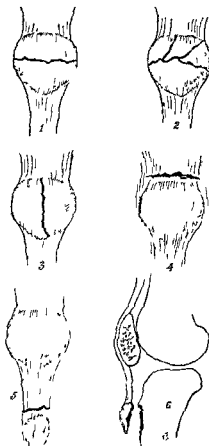


Fig 127 —Various traumatic conditions of patella and its vicinity 1, Transverse fracture of patella, 2, stellate fracture of patella 3, longitudinal fracture of patella, 4, transverse laceration of aponeurosis just above patella, 5, laceration of ligamentum patella 6, tearing off of tubercle of tibia

of the fracture and the wide separation of the fragments. It is necessary in these cases to take both an anteroposterior and a lateral view, because not all fractures are of the transverse

variety Figure 127 illustrates some of the most frequent injuries of the patella and of the structures immediately adjacent thereto In the examination of some of these the x ray is of great value, but in others we can only make the diagnosis by finding the patella itself intact or by demonstrating the patient's inability to extend the leg A glance at this diagram will show you that we may have transverse, stellate, or even longitudinal fractures of the patella¹

The conditions which may simulate fracture of the patella having in common the symptom of inability to extend the knee and of swelling of the knee joint following trauma are (a) Rupture of the aponeurosis of the quadriceps extensor just above the patella, (b) laceration of the ligamentum patellæ itself, (3) evulsion of the tubercle of the tibia The last-named condition can be easily differentiated from fracture of the patella by the fact that the point of maximum pain is over the head of the tibia there is less apt to be much swelling of the knee-joint, and a lateral x ray view will show the condition At times one can demonstrate preternatural mobility at the point of the insertion of the ligamentum patellæ into the tibia In the case of a laceration of the ligamentum patellæ we find the patella intact but palpation will reveal a gap when the knee is flexed at a point between the patella itself and the tubercle of the tibia Finally in case of laceration of the quadriceps aponeurosis above the patella the patella remains intact, but a gap should be demonstrable above the patella when the patient makes an effort to extend the knee or when the latter is forcibly flexed

In some cases of fracture of the patella, as in the patient on whom we are to operate today, the diagnosis is easy, because one can feel a space between the fragments and can manipulate them separately from side to side—a very important fact I recently encountered a case in which it was necessary to resort to the aid of the x ray in order to exclude fracture There was a condition somewhat similar to that occasionally found

¹ Hessert recently described a case of longitudinal fracture of the patella in the *Surgical Clinics of Chicago* August 1918 p 849.

beneath the pericranium after trauma, namely, a hematoma which, becoming partly organized, produces a lesion with a soft center and a raised, hard margin, simulating depressed fracture very closely. In this instance the organizing clot on the anterior surface of the patella produced a transverse groove on

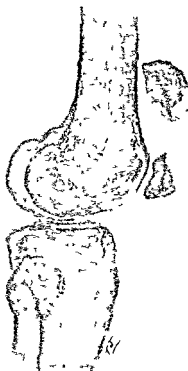


Fig. 128.—Fracture of patella with wide separation of fragments. In spite of the latter condition the patient had excellent use of the limb and extension was perfect

the patella which on palpation could not be differentiated from a transverse fracture

For many years the fracture of the patella itself was considered the most important feature. The increasing number of operations for fracture of the patella and observations on non-

operated cases have taught us that the power of extension of the knee may be practically perfect even though there be a wide separation of the fragments. Figure 128 is an x ray print from a case which I have recently seen in which there was a space nearly 3 inches in width between the two fragments following a fracture of the patella ten years ago but with very little tearing of the lateral aponeurosis. The patient had not been operated upon and yet today the power of extension is practically perfect and there is only a slight lump and the presence of a space between the two fragments of the patella to indicate that there has ever been a fracture of this bone. This case emphasizes a point which I am trying to bring out namely that the patella itself is practically a sesamoid bone and it can be completely removed without interfering with the extension of the knee-joint.

Observations of operated and non-operated cases of fracture of the patella has clearly demonstrated the fact that the chief advantage of the operative treatment is to establish a firm union of the torn lateral aponeurosis. The principal conditions which are encountered in fracture of the patella are well illustrated in Fig 127. They are (a) Effusion of blood into all portions of the joint. The blood clots separate not only the fractured fragments themselves but also the surfaces of the torn aponeurosis. (b) an inversion of the periosteum so that it completely covers the fractured surfaces and prevents accurate union of the fragments. (c) a transverse tear of the aponeurosis and of the capsule of the joint.

The lateral portion of the aponeurosis is the chief factor in extension of the knee. It has a firm hold on the patella because it fuses with the periosteal covering of the patella when it reaches the edges of that bone. In the treatment of this condition I do not doubt but that fairly satisfactory results can be secured by non-operative methods but in view of the fact that our knowledge of the pathology of fracture of the patella has been cleared up by frequent operations I cannot see why a case should be treated by a non-operative method if a capable surgeon versed in the details of modern bone surgery and aided by proper

beneath the pericranium after trauma, namely, a hematoma which, becoming partly organized, produces a lesion with a soft center and a raised, hard margin, simulating depressed fracture very closely. In this instance the organizing clot on the anterior surface of the patella produced a transverse groove on

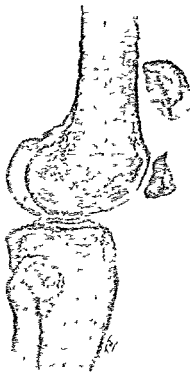


Fig 128—Fracture of patella with wide separation of fragments. In spite of the latter condition the patient had excellent use of the limb and extension was perfect

the patella which on palpation could not be differentiated from a transverse fracture

For many years the fracture of the patella itself was considered the most important feature. The increasing number of operations for fracture of the patella and observations on non-

are so extensive that it is advisable not to operate until all chances of infection from these superficial injuries has been eliminated. This is especially true of cases which have not been seen by surgeons until two or three days after the accident.

In accordance with my own belief in regard to early operations we shall proceed to perform an operation upon this case today forty eight hours after the accident. The question of the preparation of the skin requires no special comment as it is pretty well standardized. Personally I prefer two coats of $3\frac{1}{2}$ per cent tincture of iodine applied from the hip joint to the level of the ankles that is well away from the operative field. In regard to the incision nearly every surgeon has his preference. One employs a U shaped incision with the convexity upward another with the convexity downward and others employ a transverse incision. I do not believe that this is a very important point because the wound will heal as well with one form of incision as with another and there is just as much danger of tension upon the edges of the wound during active mobilization with one incision as with the other. Personally I prefer a transverse incision which we will use in this case.

Having made this incision from a point over the external condyle of the femur to a similar point over the internal condyle in order to secure a wide exposure of the lateral aponeurosis we shall proceed to utilize the principles of the Lane technic—that is to permit the gloved fingers to come in contact with the wound surfaces as little as possible. I am now able to demonstrate the three principal pathologic factors in fracture of the patella namely the turning in of the periosteum over the fractured surfaces a wide tear of the lateral aponeurosis on either side of the patella and an extensive extravasation of blood both into the tissues in front of the patella and into the joint proper.

The first step consists in reflecting the periosteal-aponeurotic covering by lifting it up from between the fractured surfaces of the patella so that the flap can be utilized later for the purpose of approximation. The two fragments of the patella can be seen to be widely separated and can be moved laterally in

surroundings can be secured. You must understand that the best we can hope for by the operative and non-operative methods is a fibrous union of the patella. As I have stated previously, those who advocate non-operative treatment overlook the essential fact that the tearing of the lateral aponeurosis is far more important for the future usefulness of the knee than the fracture of the patella itself. An accurate approximation of the torn surfaces of the aponeurosis, you will grant, can be secured better by open operation than by merely attempting to approximate the *fractured fragments*. Another great advantage of the operative method, as we shall see later, is the ability to secure active mobilization of the joint at a much earlier period than is possible with the *non-operative methods*, which require at least six weeks of fixation. It is my own practice to begin both active and passive movements of the knee-joint within ten days after operation, and I know of surgeons who are even more radical and begin as early as the third or fourth day. You can understand the great importance of this early mobilization when I state a fact you have probably frequently observed, namely, that a fibrous ankylosis of the knee-joint is more difficult to overcome than that of almost any other joint in the body.

Now, as to the time of operation, some of our surgeons advocate waiting for ten to fourteen days after injury. Their argument is that by this time the process of immunization against infection has taken place in the vicinity of such an injury. Infection is much less likely to occur at this time than when the case is operated upon at an earlier period. There may be an element of truth in this argument, but my own experience and that of many other surgeons has led me to believe that there is practically no difference from the standpoint of liability to infection between a case operated upon within the first few days and one operated ten to fourteen days after injury. The observations of those surgeons who believe in delaying operation is of value, however, in demonstrating the fact that we can safely wait until a later period and secure good results. At times the abrasions of the skin in the vicinity of the knee-joint

dependent of each other, which I have previously told you is an important symptom in the diagnosis of fracture of the patella. We find an extensive tear in the lateral aponeurosis for a distance of 2 inches on each side of the patella. We must expose it until we reach the point where the tear stops. Having removed the blood-clots from between the torn surfaces of the patella and lateral aponeurosis, we proceed as quickly as possible to unite the edges of the lateral aponeurosis with fine kangaroo tendon or chromic catgut (Fig 129, 3). If the imbrication method similar to that employed in the repair of ventral or inguinal hernia is used the aponeurosis becomes a very strong structure. This overlapping of the edges of the torn aponeurosis can be rapidly accomplished, and results in such a close approximation of the fractured surfaces of the patella itself that it is seldom necessary to insert more than a few sutures into the aponeuroticoperiosteal covering of the patella. You will observe that I have employed fine kangaroo tendon mattress sutures to bring the lower edge of the torn aponeurosis well beneath the inner surface of the upper half (Fig 129, 4). The free edge of the upper flap of the aponeurosis will now be approximated to the outer surface of the lower half in accordance with the principles of the overlapping or imbrication method, by a continuous fine chromic catgut suture which stops at the edge of the patella on either side. The torn edges of the periosteal aponeurotic covering of the bone itself is finally united with a fine continuous chromic catgut suture. This completes the operation and we

Fig 129 —Fracture of patella. 1 Sagittal view of knee showing effusion of blood into all portions of joint in a case of fracture of patella. Notice how blood-clot separates fragments and how

sutures can be inserted through periosteal-aponeurotic covering on anterior surface of patella after everting the torn edges but these additional sutures are seldom required. 4 chromic (fine) catgut continuous suture of overlapped free edges of aponeurosis and of the torn periosteal-aponeurotic covering of the patella.

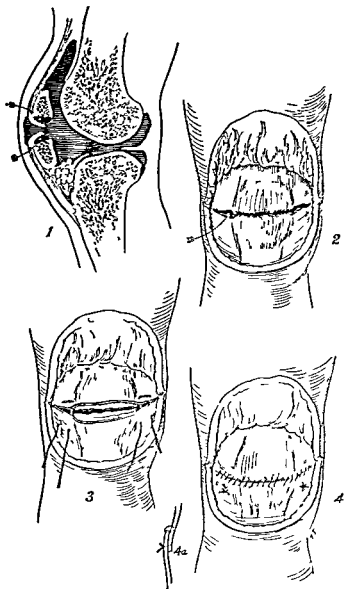


Fig 129

CLINIC OF DR GATEWOOD

PRESBYTERIAN HOSPITAL

A STRANGULATED EPIGASTRIC HERNIA

Summary Typical history and physical findings operation—choice of anesthetic—repair of abdominal wall by the Mayo technic rarity of epigastric hernias—marked local tenderness a constant symptom.

THIS patient entered the hospital last night on another service and has just been transferred to me. She is a Russian Jewess, sixty seven years of age. Her general health has been good until the last few years, when she began to get short of breath on exertion. She had had some swelling of her feet although none is present now. She has had ten children, the youngest of which is twenty five years old. In 1893, following a prolonged and complicated labor, she noticed a swelling in the region of her umbilicus. This has gradually increased, but is not more than 3 cm in diameter at the present time. On a number of occasions she has had severe pain in this region lasting sometimes several hours, but never accompanied by vomiting. At such times there would be a hard swelling at or just below the umbilicus. The patient had such an attack nine days ago and the pain has persisted intermittently ever since. Last evening she began to vomit and her pains became paroxysmal and severe. Her temperature is 98.6° F and her pulse is 120. She has been habitually constipated, but a good stool was obtained by the use of an injection last night. Examination reveals an obese woman with a tense tympanitic abdomen moderately tender throughout. She looks sick and seems to be in considerable pain. Just below the umbilicus is a slightly elevated mass, about 3 cm in diameter, which is so tender that careful examination is out of the question. I

shall close the wound without drainage by uniting the edges with silkworm gut sutures and immobilize the limb by means of a molded plaster-of Paris posterior splint

PRESENTATION OF CASE FOUR WEEKS LATER

I wish to show you today the patient with fracture of the patella which we operated upon four weeks ago. The sutures were removed at the end of ten days, the wound having healed by primary union. Both active and passive mobilization were begun on the tenth day. You will observe today that we have secured a practically normal range of mobility of the knee-joint in the interval between the beginning of active mobilization and the present time. I cannot emphasize too strongly the advisability of early mobilization in these cases especially active mobilization. It is not necessary to employ any particular form of apparatus, but the patient should be encouraged to walk upon the injured limb within two weeks after the injury and to bend the knee himself. In this case much aid has been derived from daily massage of the quadriceps extensor muscle, which rapidly atrophies in these cases, and in passive mobilization of the knee-joint. The case illustrates the rapid advance which we have made in the treatment of these injuries.

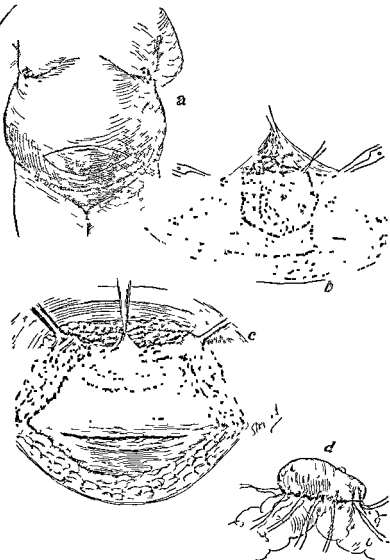


Fig 130 —a, Transverse incision, b, umbilical hernial sac freed and opened c upper margin of wound retracted, exposing strangulated epigastric hernia d, closure of gangrenous ring of colon with Lembert sutures.

have made the diagnosis of strangulated umbilical hernia and shall proceed at once to operate

On account of her age and her general condition I should greatly prefer local anesthesia, but owing to the fact that I cannot converse sufficiently with her to gain her co-operation and as there has been no great amount of vomiting we are employing ether. She has no albumin or casts in the two specimens of urine thus far examined

I am now making a large elliptical transverse incision (Fig 130, *a*) encircling the tumor and dissecting back the skin and fat so that the anterior sheath of the rectus and the linea alba are well exposed. An umbilical hernial sac about 6 cm in diameter is carefully isolated. As I incise the sac I find it is filled with edematous omentum which is adherent to the margins by very dense fibrous adhesions, proving conclusively that the incarcerated omentum has been present within the sac for years. The omentum is now entirely free and I have ligated all bleeding points (Fig 130, *b*). It does not seem to me that this can explain her acute symptoms and as I replace this omental stump I shall explore the abdomen. I can feel a mass adherent to the abdominal wall about 5 cm above my present abdominal opening. This feels like the transverse colon. Dissecting the fat and fascia upward, I find a second hernial sac which did not protrude sufficiently to alter the contour of the abdomen (Fig 130 *c*). Had the patient not been so tender and had I made a more careful palpatory examination I might have felt this mass. It is evidently a strangulated epigastric hernia and probably the real cause of her symptoms. Isolating the sac I find that it is shaped like a mushroom and about 3 cm in its greatest diameter. Opening it by a transverse incision I find that it contains purplish bowel and considerable dark brown fluid. From the bands and fat tags I know that it is a hernia of the transverse colon. Since but a portion of the circumference of the bowel is included in the hernia we make a diagnosis of Richter's hernia. It is necessary to split the linea alba transversely on either side to relieve the tension and to permit me to examine the strangulated area. *Here is a dark brown ring*

operation very well and there has been no vomiting during the administration of the anesthetic



Fig 131 —e Closure of hernial openings with mattress sutures of heavy catgut f final suture of overlapped edges

Epigastric hernias are rare Of 1000 consecutive hernia operations performed in the Presbyterian Hospital but 9 were for epigastric hernia This is the second epigastric hernia which I have seen strangulated In the first case I made the diag

about 1 cm in diameter at the site of the constriction. I shall apply hot towels to this portion of the bowel changing them frequently for the next few minutes. All of the bowel excepting this narrow ring has entirely recovered its color and I shall cover in this strip with a few Lembert sutures of fine catgut (Fig 130 d). Were the doubtful area so large that it could not be thus inverted without compromising the lumen of the bowel I should wait even longer in the hope that the circulation would be restored for I should hate very much to resect. Having replaced the colon it is necessary to remove both hernial sacs *before closing*. These are cut flush with the abdominal aponeurosis.

How shall I repair the two hernial openings? I believe the best method of closing an umbilical hernia is by the transverse imbrication method described by W J Mayo. In this instance however instead of overlapping from above downward I am closing the umbilical opening in the reverse manner with three mattress sutures of heavy catgut. Inserting my needle about 2 cm. from the lower margin of the wound I pass it through the entire thickness of the abdominal aponeurosis and the peritoneum. The needle is now introduced near the margin above the hiatus carefully taking a good transverse bite of the entire wall. The stitch is completed by passing the needle from *within outward in the lower flap* about 1.5 cm lateralward from the point at which it was begun. A forceps is placed on this stitch and it will not be tied until all the others are in place. Three such sutures completely close the opening. I will now close my epigastric opening by overlapping from above downward as in the usual Mayo method of closure (Fig 131 e). This brings the two flaps together and their free borders will be approximated by a continuous catgut suture (Fig 131 f). In order to obliterate the dead space and as a further reinforcement I am putting in several silkworm tension sutures taking in the aponeurosis. Owing to the possibility of an infection which might dissect a considerable distance in this fatty wall I shall slip a drain of soft collapsible rubber tubing into either end of the incision. The patient has stood the rather tedious

operation very well and there has been no vomiting during the administration of the anesthetic



Fig 131 —e Closure of hernial openings with mattress sutures of heavy catgut *f* final suture of overlapped edges

Epigastric hernias are rare Of 1000 consecutive hernia operations performed in the Presbyterian Hospital but 9 were for epigastric hernia This is the second epigastric hernia which I have seen strangulated In the first case I made the diag

nosis before operation and later reported it in the Journal of the American Medical Association (1916 p 85) In that case about 4 inches of small intestine had been strangulated for three days. In looking up the literature at that time I found only about a dozen cases. Since then Mackworth has reported 2 cases which he observed among the natives in India. Moschcowitz could only find 4 cases in the literature in which transverse colon was contained in the sac. Epigastric hernias, or hernias of the linea alba above the umbilicus almost invariably occur within the first 8 cm above the umbilicus. The majority of them are not true hernias as we are accustomed to think of a hernia. That is, they are merely a protrusion of preperitoneal fat through a defect in the linea alba without any peritoneal sac. Most of them develop at the site of a small perforating blood vessel and rarely are more than 2 cm in diameter. Some of them are entirely silent but the majority cause symptoms out of proportion to the pathology. Nausea vomiting pain in the epigastrium and symptoms resembling those of an ulcer have frequently been described. These symptoms have been ascribed to portions of the stomach or bowel becoming pinched in the sac, but the extreme rarity of strangulation and the fact that many of the cases have no peritoneal sac at all makes this theory untenable. It is much more likely that the pain is entirely reflex either from peritoneal irritation or from traction upon the falciform ligament of the liver. Marked tenderness over the hernia might be mentioned as a constant symptom. This sign alone has been sufficient to make a diagnosis in some cases. One or two cases have been reported in which a fecal fistula developed without general peritonitis. It is possible that such a state of affairs might have developed here by a plastic exudate walling the colon off before the gangrenous area ruptured.

CLINIC OF DR EMMET A PRINTY

MERCY HOSPITAL

POSTOPERATIVE DIPHThERIC INFECTION OF A HERNIA WOUND

Summary Clinical history of patient, demonstration of diphtheria bacilli in wound and successful treatment by antitoxin

I WISH to present here a complication sufficiently out of the ordinary to make it interesting

History—The patient is a married woman, age thirty-eight, no children, one miscarriage (at six weeks) about ten years ago Menstrual history negative Family history negative

Past History—A severe typhoid when twenty-one years of age, and most of her present trouble dates from that time When a child she had a left inguinal hernia, which was treated with a truss, and for many years has had no protrusion in that region, but has been troubled with aching and occasional pains, especially after long walks, and often at night is awakened by pains of a stretching nature in that region, and finds relief by flexing the left leg

Present complaint dates back to previous typhoid. A gradually increasing "indigestion," with frequent nausea and occasional vomiting A great deal of distention at times, and always troubled with "gas" Occasional attacks of colicky pains, not localized Patient described distress in stomach as being more a difficulty in the food getting out of the stomach than in being digested Nothing elicited to suggest ulcer Suffers continually with "backache," especially on arising, usually in lower dorsal and in lumbar region, but sometimes at a higher or lower level Usually subsides when patient is up and around for a while Obstinate constipation, taking cathartics regu-

larly, and often necessary to aid them with enemas. Frequent headaches partly attributable to refractive errors which have been corrected with glasses.

Physical examination negative as to head, neck, extremities and spine. Appeared to be of a potentially neurotic type. Abdomen very slightly distended with stomach first portion of duodenum and colon quite tympanitic. Slight tenderness in gall bladder region and over appendix. Pylorus not definitely palpable. Left inguinal region tender but no bulging or palpable sac. Subcutaneous (external) ring large. Slight impulse on coughing. Routine blood, urine and blood pressure examination negative. Stomach contents negative. Stomach distress relieved greatly by prescription containing sodium bicarbonate, bismuth and nuxvomica.

x-Ray examination of gastro-intestinal tract (plates and fluoroscope) as reported by our roentgenologist, Mr. Arthur E. Willis, consisted of the following in brief: Partial pyloric obstruction, possibly spasmodic, none of meal passing out for forty-five minutes. Stomach lies entirely to left of midline and pylorus in midline. Later a collection of bismuth in cecum, hepatic flexure quite distended with gas. Negative as to gall bladder. *x*-Ray of spine made to eliminate any possibility of spondylitis, especially of a posttyphoidal type, as this condition is not so infrequent a complication as might be inferred from the literature and is often unrecognized. It seemed improbable in this case owing to the long period that the complaint covered, the lack of physical findings and the absence of disability at any time, but the examination was made in order to overlook nothing and on account of the severity of the subjective symptoms.

Everything seemed to point to pathology in the region of gall bladder, pylorus, duodenum and hepatic flexure, probably adhesions from a mild chronic cholecystitis and with an associated or primary chronic appendicitis. As satisfactory relief was not obtained by medical measures, operation was decided upon. The hernia and the appendix were to be the definite points of attack with thorough exploration of the upper

abdomen This decision was concurred in by Dr C F Sawyer, who saw the case in consultation

Operation (February 4th) —A low right rectus gall bladder incision No adhesions encountered Stomach distended, and first portion of duodenum quite dilated Pyloric ring small, but normal Stomach and duodenum had a somewhat congested appearance, but nothing found to suggest old or new ulcerative process, or any localized pathology Gall-bladder moderately large, but compressible, color slightly pale No gross evidence of anything necessitating surgical measures Ducts normal Duodenum was traced to jejunum, but nothing found to account for dilatation of first portion No evidence of mechanical constriction at point where duodenum is crossed by base of mesentery and superior mesenteric artery Colon examination negative Head of pancreas slightly large

Incision was extended down through skin and fascia, and a small high appendix incision was made through rectus sheath, muscle, and peritoneum, leaving a connecting bridge of sheath, muscle, and peritoneum between the upper and lower parts of the continuous wound The appendix was found near the pelvic brim, kinked sharply near its middle, and bound down at that point by a firm adhesion Tip hard and bulbous Typical appendicitis obliterans type Removed in usual way, and stump inverted Pelvic examination revealed a small, hard nodular uterus The left inguinal region was then palpated from within the abdomen No viscera adherent in that region, but abdominal (internal) ring large, and admitted half or slightly more of first phalanx of index finger into a peritoneal protusion Abdominal incision closed, using the author's method of preliminary mattress sutures in peritoneal layer, as described in a previous number of the Surgical Clinics (October, 1918)

Left inguinal canal exposed through small incision Slight adhesions gave evidence of the previous wearing of a truss No sac could be isolated, but a broad fibrous band, adherent to posterior wall of canal, to edge of internal oblique muscle and to round ligament, proved to be the obliterated remains of the former sac This was left undisturbed to avoid a needless

had been 98 to 104 after opening wound and applying heat it fell slightly and again after injection of antitoxin

All sutures had been removed owing to reference of pain to their locality Daily irrigations with Dakin's solution and application of Dichloramin T It was thought best not to apply antitoxic serum directly to wound on account of possibility of anaphylaxis as two doses of serum had been injected Later a sharply circumscribed area of about the size of a half dollar and about 4 cm distal to inguinal ligament in line with anterior superior spine of ileum became slightly painful and felt soft and fluctuating to the touch Not as a purulent focus would feel but more as if there had been a non purulent liquefaction of tissue in that area This was probed from the wound and a light brownish liquid escaped Smears and cultures now showed complete absence of diphtheria organisms and presence of a Gram negative cocco-bacillus No pus organisms

Throat culture from patient showed variety of organisms with rarely a Gram positive clubbed form of bacillus suggesting the involution type of *Bacillus diphtheriae* (Type A) No virulent type of diphtheria bacillus Blood count now 5280 Throat smears from attendants negative

The wound appearance became darker by degrees from brown to almost black in areas and dry especially along skin edges Cutaneous margins showed a rat bitten appearance especially at superior and inferior portions of incision Aponeurotic layer continues intact The early induration was so marked that I at first thought there might be trouble beneath the aponeurosis especially as there was no fluctuation and when the wound was first opened we examined this layer carefully

The induration has markedly subsided and there is a slightly brownish discharge with a fecal odor No gas Bowel movements continue normal and painless Appetite better than it has been for years No gastric distress after meals and no bloating as previously

This case is undoubtedly one of a true diphtheric wound infection The bacteriologic findings were corroborated by Dr J J Moore of the National Pathological Laboratory The

trauma Region closed by Andrews imbrication method and with the Andrews stitch Complete time of operation one hour and twenty five minutes

Early postoperative course normal Temperature 99° to 100° F reaching normal on morning of February 6th (eighteen hours after operation) A few hours later it began to rise to 99.2° F then 99.6° F and 100° F at 8 00 P M Next day about the same but fell then to 99.2° and 99.6° F following calomel and saline The following day patient complained to nurse of a hot feeling along the suture line in left inguinal region and a superficial pain The following morning examination of that region showed a reddened and indurated appearance of the hernia wound but no suggestion of discharge or oozing from the suture line Looked like a cellulitis of streptococcic type Some sutures were removed and edges separated Partial healing had occurred The skin and superficial fascia were seen to be much thickened the edges of wound irregular and covered with an adherant dirty gray membrane no liquefaction I stated to the intern at that time that this had the appearance of a typical diphtheric infection The patient on being questioned stated that she had never had diphtheria but that some years previously her family had been the only one to escape an epidemic of diphtheria in their city She had very frequently had severe sore throat

A careful examination of the abdominal wound (to prevent contamination) showed a perfectly normal and healthy area with no suggestion of an inflammatory process Hot dressings were applied to hernia region and temperature fell slightly White count 16 400 Smears and culture were ordered and 2000 units of antitoxin were given Bacteriologic report from smears and culture showed a Gram positive diphtheria like organism with highly metachromatic granules As stated in this report If clinical findings warrant it I should not hesitate calling this *Bacillus diphtheriae* No pus obtained on taking smear 3000 more units of antitoxin were then given together with calcium lactate gr xv t i d Temperature normal to 99.2° F since White count 11 600 Pulse 78 to 90 Early the pulse

CLINIC OF DR. ROBERT H. HERBST

PRESBYTERIAN HOSPITAL

SEVERE HEMATURIA—EXCISION OF MALIGNANT TUMOR OF BLADDER

Summary Patient giving history of severe hematuria, persistence of hemorrhage preventing preoperative cystoscopic diagnosis tumor of bladder excised with electrocautery knife followed by applications of radium to former site of tumor

THIS patient entered the hospital five days ago giving the following history

He is fifty six years of age

Previous operations Removal of chancre

Previous cystoscopies Day before entrance

Previous x-rays None

Previous illness Diseases of childhood

Present complaint Hematuria, frequency of urination, painful and burning urination

Onset and course Present attack of blood in urine began fifteen days ago, and has persisted, patient states, continuously since Urine is thick, bright red and contains at times many clots and small fibers Blood seems to be mixed uniformly with urine rather than appearing at beginning or end of urination Previous attack two years ago, lasting thirty-six hours during which time bleeding was excessive

There was pain, fairly severe in character, present over bladder region There has been an increased frequency of urination for several years, but more recently it has become marked Gets up two or three times at night to urinate and frequently during the day There is an associated burning and pain on urination, which has been present more or less for three years

appearance of the wound with membrane and the necrotic process, together with subsidence of symptoms following antitoxin, and subsequent disappearance of diphtheria bacilli from the wound, leave no room for doubt.

These infections usually start as a cutaneous and subcutaneous phlegmon, with considerable induration, and no fluctuation or suppuration until secondarily infected. Trousseau contended that diphtheria attacks the skin only when preceded by some tissue loss, no matter how slight. All of the diphtheric sequelæ may complicate and must be guarded against by early recognition and exhibition of antitoxic serum.

An early routine bacteriologic examination should be made of all infected wounds, and when they are dressed gloves should be worn to prevent spread of infection, as well as to protect the attendant. In these cases all dressings should be destroyed, and the case isolated.

An interesting feature of this case is that the larger abdominal incision has healed exceptionally well. The stitches removed as usual on the tenth day. Did this infection occur in the operating room, or subsequently? Or could it be traced to the skin suture material (horsehair)? The discomfort as well as the starting-point of infection seemed to be entirely cutaneous. Investigation will be continued in order to ascertain the source of infection if possible. An autovaccine will be used to supplement the antitoxin. We anticipate slow healing and an ugly scar.

CLINIC OF DR ROBERT H HERBST

PRESBYTERIAN HOSPITAL

SEVERE HEMATURIA—EXCISION OF MALIGNANT TUMOR OF BLADDER

Summary Patient giving history of severe hematuria persistence of hemorrhage preventing preoperative cystoscopic diagnosis tumor of bladder excised with electrocautery knife followed by applications of radium to former site of tumor

THIS patient entered the hospital five days ago giving the following history

He is fifty six years of age

Previous operations Removal of chancre

Previous cystoscopies Day before entrance

Previous x rays None

Previous illness Diseases of childhood

Present complaint Hematuria, frequency of urination, painful and burning urination

Onset and course Present attack of blood in urine began fifteen days ago, and has persisted, patient states, continuously since Urine is thick, bright red and contains at times many clots and small fibers Blood seems to be mixed uniformly with urine rather than appearing at beginning or end of urination Previous attack two years ago, lasting thirty-six hours, during which time bleeding was excessive

There was pain, fairly severe in character present over bladder region There has been an increased frequency of urination for several years, but more recently it has become marked Gets up two or three times at night to urinate and frequently during the day There is an associated burning and pain on urination, which has been present more or less for three years

Appetite is good no loss in weight Bowels move regularly sleeps well Is negative to headache dizziness failing vision fever dyspnea abdominal distress etc.

Venereal history Orchitis cause unknown Sore on penis which was removed surgically Wassermann test negative

Physical examination Patient is a well nourished adult white male fifty-six years old Color is pale but states he feels fine

Scalp Negative

Eyes Pupils react to light and accommodation and are equal.

Teeth Plate above and many crowns and fillings below Pyorrhea 2 plus

Tonsils Negative

Chest Expansion is good Lung borders are normal no râles Apex beat inside the mammary line Heart tones distinct. Slight hemie murmur Rhythm regular

Liver spleen and kidney not palpable Some tenderness over bladder region

Patellar reflexes present No edema of feet or ankles

Rectal examination reveals left seminal vesicle enlarged and tender

I am going to open this man's bladder today because he is bleeding so rapidly that we have not been able to determine cystoscopically the nature of the intravesical pathology and he has reached a point where it will be unsafe to delay further operative interference

Bleeding from the urinary tract will usually quiet down when the patient is placed at absolute rest in bed with a liberal administration of morphin and possibly the addition of horse-serum Whenever given a case of hematuria which can be carefully watched as to pulse-rate and blood findings it is well to follow it until one can determine the location and cause of the hemorrhage Today this man's pulse is running about 130 His hemoglobin is between 35 and 40 per cent. His red count is 2 000 000 In other words he has reached the limit. You will note from his history that he was bleeding for fifteen days

before he entered the hospital, and during his five days here we have not succeeded in controlling the hemorrhage sufficiently to make an efficient cystoscopic diagnosis

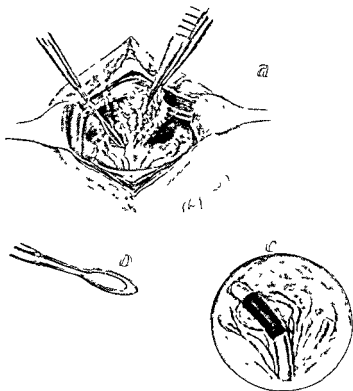


Fig. 132—Excision of papilloma of bladder with electrocautery knife *a* Grasping pedicle of tumor with forceps and excising with electrocautery knife *b* electrocautery knife *c*, application of radium to former site of tumor

I am now going to make the usual incision through the abdominal wall, making the incision into the bladder sufficiently large to obtain good inspection of the interior. You will note that the bladder is filled with blood-clots which I will now turn

out I can see a tumor about the size of an English walnut which is attached by a broad base to the posterior wall of the bladder just internal to the right ureteral orifice. I will carefully grasp the pedicle (Fig. 132, a) and with this electrocautery knife (Fig. 132, b) I will excise the tumor close to its insertion to the bladder wall. I will now thoroughly cauterize the base. There are no other tumors to be found, and as the bleeding has entirely ceased I will insert this drainage tube and close in the usual way.

I do not wish to take the time today to discuss the pathology of bladder tumors but merely wish to state that I take about the following course in handling these cases. All tumors that appear to be clinically benign are removed by fulguration. Tumors which are suspiciously malignant or prove to be so and located in accessible parts of the bladder I excise with the bladder wall. Malignant tumors located in inaccessible parts of the bladder are either removed by fulguration or the electrocautery knife and such removal is followed by the application of radium to the area from which the tumor is removed. In using radium in the treatment of these tumors I believe it is essential that it be applied directly to the tumor area (Fig. 132 c). This is not easily accomplished by introducing it through a suprapubic wound because of the difficulty of keeping the radium in place but can be well carried out in most instances by introducing it through the urethra, the radium being placed in the beak of a sound. In this way it can be fixed.

Later Course—This patient is one from which we removed a bladder tumor some weeks ago. Sections showed it to be a papillary carcinoma. We will now introduce a cystoscope through this small suprapubic wound. I can see just to the left of the right ureteral orifice a small area about the size of a 10-cent piece. This appears as an area denuded of mucous membrane. I will insert this sound through the urethra into the bladder and by turning the handle of it to the right I bring the part containing the radium in contact with the area from which the tumor was removed. We will reintroduce the cystoscope later to determine whether the sound is still in the

correct position. There are 50 mg. of radium in this sound and we will give him about a twelve hour exposure.

After-history—Three months after operation the bladder wound is closed. Cystoscopic examination reveals just a slight reddening at the former site of the tumor. The area appears to be covered with healthy mucosa.

Pathologist's Report—Microscopically the tissue is composed of irregularly arranged villous processes. The width of a villous process varies from 10 to 20 cells. These cells are irregularly arranged, are of various widths, and contain mitotic figures. Microscopic diagnosis, papillary carcinoma.

out I can see a tumor about the size of an English walnut which is attached by a broad base to the posterior wall of the bladder just internal to the right ureteral orifice. I will carefully grasp the pedicle (Fig 132 *a*) and with this electrocautery knife (Fig 132, *b*) I will excise the tumor close to its insertion to the bladder wall. I will now thoroughly cauterize the base. There are no other tumors to be found and as the bleeding has entirely ceased I will insert this drainage tube and close in the usual way.

I do not wish to take the time today to discuss the pathology of bladder tumors but merely wish to state that I take about the following course in handling these cases. All tumors that appear to be clinically benign are removed by fulguration. Tumors which are suspiciously malignant or prove to be so and located in accessible parts of the bladder I excise with the bladder wall. Malignant tumors located in inaccessible parts of the bladder are either removed by fulguration or the electrocautery knife and such removal is followed by the application of radium to the area from which the tumor is removed. In using radium in the treatment of these tumors I believe it is essential that it be applied directly to the tumor area (Fig 132 *c*). This is not easily accomplished by introducing it through a suprapubic wound because of the difficulty of keeping the radium in place but can be well carried out in most instances by introducing it through the urethra the radium being placed in the beak of a sound. In this way it can be fixed.

Later Course—This patient is one from which we removed a bladder tumor some weeks ago. Sections showed it to be a papillary carcinoma. We will now introduce a cystoscope through this small suprapubic wound. I can see just to the left of the right ureteral orifice a small area about the size of a 10-cent piece. This appears as an area denuded of mucous membrane. I will insert this sound through the urethra into the bladder and by turning the handle of it to the right I bring the part containing the radium in contact with the area from which the tumor was removed. We will reintroduce the cystoscope later to determine whether the sound is still in the

PROSTATECTOMY FOR HYPERTROPHY OF THE PROSTATE GLAND

Summary Importance of pre-operative study in selection of the candidate for prostatectomy use of blood chemistry in making such a selection value of the two-stage procedure in some cases

THE next case I wish to present this morning is that of a man fifty nine years old whose chief complaint is frequent and imperative urination

His history is negative as to previous illness operations cystoscopies and x rays

Patient states that for the past three or four years he has gotten up five to seven times every night to urinate and during the day urinations occur more often There has been a steady progression in the frequency The amount of urine passed at one time is small but there is often great difficulty encountered in starting the stream However once the urine has started the flow goes on without interruption He thinks the size of the stream is smaller perhaps than formerly There is no pain before during or immediately after urination and also there is no associated burning or discomfort The urine is free from macroscopic blood or pus so far as he knows

He states that he is quite constipated by which he means the bowels move irregularly if not influenced by a cathartic

Negative to headache dizziness tinnitus palpitation of the heart sore throat abdominal distress etc Appetite is good Slight if any loss in weight sleeps well alcoholics none

Venereal history Gonorrheal infection at fifteen years Never had a lesion on penis

Marital history Married thirty five years Two children dead both from peritonitis following appendicitis

Physical examination is negative Pupils are equal and react to light and accommodation Liver is palpable just above costal margin and is not tender Spleen kidneys and colon

the median line about 3 inches in length, going through the skin and superficial fascia. Separating the recti, we come down to the prevesical fat. With the finger covered with a gauze sponge

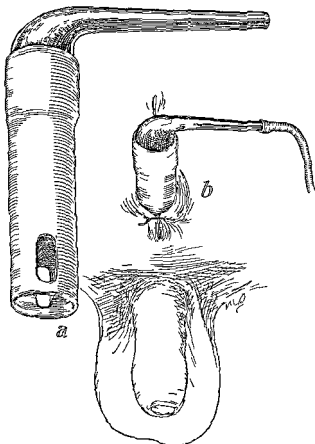


Fig 133 —a Freyer drainage tube b tube in position

I will push the fat and peritoneum upward, which exposes the bladder wall. I plunge the knife into the bladder, making an incision about 1 inch in length and as high up as possible. In inserting my finger into the bladder, I can palpate a mass sur-

are not palpable No masses no glandular enlargements. Patellar reflexes lively External genitalia negative

Rectal examination shows a moderately enlarged prostate left side of which is larger than right. The surface of the tumor is smooth

QUANTITATIVE ANALYSIS OF URINE

	Vol. of urine, c. c.	Specific gravity	Total solids, grams.	Reaction.	Sugar grams.	Albumen.
1st day	1500	1030	96.6	alkaline	0	3 mm.
2d day	1200	1030	99.1	"	0	3 mm.
3d day	1000	1030	99.9		0	3 mm.

First kidney function test Phenolsulphonephthalein intravenously Time of appearance eleven minutes. First half hour, 20 per cent., second half hour 15 per cent.

Second kidney function test Time of appearance five minutes First half hour, 45 per cent second half hour 15 per cent.

Bladder urine 40 cells

Cultures of urine from bladder Growth staphylococcus

His blood pressure varies between 190 and 210 Residual urine averages about 11 ounces

Examination of blood showed blood urea 295 mg per liter of whole blood

Considering the high blood pressure this patient cannot be called a first-class risk In selecting a candidate for prostatectomy we must give special consideration to the kidney function because we know that many prostatics die because of impaired kidney function. Lately we have been supplementing our dye-tests for kidney function with an investigation of the chemistry of the blood By doing this I feel that we have a fair index of the work being done by the kidneys You will note that this man has a fair output of dye and although his urea nitrogen is above normal it can still be considered within safe limits With these findings in mind I have decided to make a two-stage prostatectomy

The bladder has been irrigated and about 12 ounces of sterile water have been left in it I will make an incision in

reinsert the drainage tube which will remain in place about forty eight hours

After history —This patient developed a temperature about the tenth day after the enucleation which however passed off in the course of a few days and was probably caused by a colon pyelitis The bladder wound is now closed and his urinary function is gradually approaching normal

Pathologist's Report —Microscopic section showed a mass of greatly enlarged and dilated tubulo alveolar glands with a great deal of intratubular smooth muscle tissue No signs of malignancy were found Diagnosis Benign adenoma of the prostate

rounding the internal urethral orifice, which is smooth and is evidently a benign adenoma of the prostate gland. No stones are to be found in the bladder. I will now introduce into the bladder this tube (Fig 133, a), which is called the Freyer drainage-tube. This is so placed that the end does not touch the posterior wall of the bladder. The stitch I am about to insert will prevent any leakage around the outside of the tube, because it fixes the anterior wall of the bladder to the abdominal wall, which is the all important factor in preventing leakage around a bladder drainage-tube. This stitch, which is silkworm gut, is inserted through all layers of the abdominal wall including the upper angle of the incision into the bladder wall. You will note that it serves two purposes. It closes the incision in the bladder wall snugly about the tube and fixes the anterior wall of the bladder to the abdominal wall. I will close the incision in the usual way and attach to this glass tube a rubber tube which will carry the drainage from the bladder into a bottle which is attached at the side of the bed. In using this method we are able to keep our bladder cases just as dry as any closed laparotomy (Fig 133, b). In the course of the next week or two this man will have a reaction caused by the relief from the back pressure of urine to his kidneys and when he has fully recovered from this we will enucleate the prostate gland.

Two Weeks Later—This is the patient whose bladder we drained two weeks ago. The relief from the retention of urine was followed by quite a severe reaction which occurred on the fifth day, and from which he has now completely recovered. You will note that the incision is healed with the exception of this small opening which has been kept open by the drainage-tube.

I will enlarge this opening by making a small transverse incision on either side down to the fascia. My assistant is now pushing up the prostate by inserting his finger into the rectum. I will insert my middle and index finger into the bladder, and, breaking through the mucous membrane just within the prostatic urethra. I will pare out the hypertrophied part of this gland. You will note there is practically no bleeding, so we will

EXTENSIVE STRICTURE OF THE URETHRA

Summary Cutting operation required in but small percentage of strictures difficulties encountered in external urethrotomy without a guide urethral implantation rarely successful extensive operation followed by good urinary function

This patient's history is as follows

He is fifty seven years old He comes in because of difficulty in urination accompanied by frequency and burning

Onset and course Beginning about one year ago and progressing since patient states that he has had difficulty with urination until at present it is practically impossible for him to pass his urine The stream which is very small is started with great difficulty and only after a great deal of straining After straining stream suddenly stops and more straining is required to start it Moreover he feels that he never fully empties the bladder and therefore experiences frequency every two hours at night and oftener during the day Burning but no severe pain is present Chills and fever have occurred since onset at first once a month and lately every two weeks not accompanied by headache

Venereal Gonorrhea thirty years ago

Marital Married thirty seven years (twice) Four children living and well by first wife one miscarriage One child by second wife living and well

Family history Father is living and well Mother died at seventy one senility Two brothers and two sisters living and well

Physical examination Patient is an adult white male fifty seven years old who is well nourished

Eyes Pupils are equal and react to light and accommodation

Teeth Many crowns apparently in poor condition

Nose Sinus infection one year ago

Tonsils Negative

Chest Expansion is good and equal on both sides, no dullness, no râles Apex beat inside mammary line Rhythm regular, pulse-rate normal no murmurs

Liver and spleen not palpable No tenderness, no masses Bladder is slightly distended

Urine Quantity, 1400 c c, specific gravity, 1020, appearance, cloudy, reaction, alkaline, albumin, nucleo trace, serum, 2.5, no sugar or casts, many leukocytes, total solids 34.9 grams

Blood Red cells, 4 500 000 leukocytes 6000, hemoglobin, 90 per cent

Blood pressure Systolic 110 and diastolic 60

Patellar reflexes are present, no edema

External genitalia Right epididymis is nodular, firm, and tender Patient states this is due to a trauma several years ago

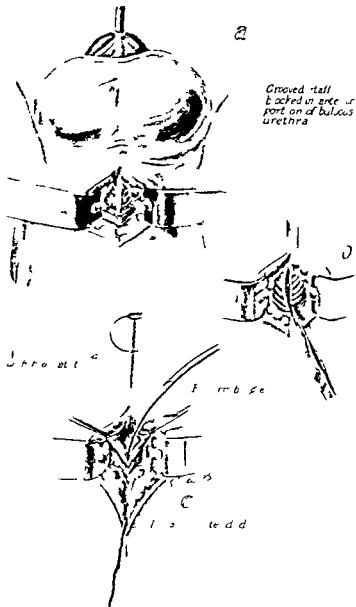
Rectal examination Prostate is enlarged, smooth, and regular Seminal vesicles palpable

The introduction of a small size Acorn sound (French No 12) meets an obstruction in the anterior extremity of the bulbous urethra Numerous attempts with a Banks bougie and filiform bougies fail to pass the obstruction Each one of these instrumentations has been followed by chill temperature and more or less toxemia The last attempt was made two days ago and was followed by some swelling in the perineum and in the right side of the scrotum evidently due to the slow leakage of urine into the tissues For this reason I have decided to operate on this patient today

There are only two types of stricture cases which require cutting operations, namely, the impassable stricture, of which this is a type, and those which are dense and fibrous and resist dilatation I will make an external urethrotomy without a guide, which changes the operation from one of the most simple in surgery to a rather difficult procedure

I will first introduce this grooved staff into the urethra down to the distal extremity of the stricture, which is in the anterior

Fig 134—*a* Median perineal incision exposing urethra containing grooved staff *b* longitudinal incision on grooved staff opening urethra *c* unsuccessful attempt to pass filiform bougie through strictured area



Chest Expansion is good and equal on both sides, no dullness, no râles Apex-beat inside mammary line Rhythm regular, pulse-rate normal, no murmurs

Liver and spleen not palpable No tenderness, no masses Bladder is slightly distended

Urine Quantity, 1400 c c, specific gravity, 1020, appearance, cloudy, reaction, alkaline, albumin, nucleo trace, serum, 2.5, no sugar or casts, many leukocytes, total solids, 34.9 grams

Blood Red cells, 4,500,000, leukocytes, 6000, hemoglobin, 90 per cent

Blood pressure Systolic 110 and diastolic 60

Patellar reflexes are present, no edema

External genitalia Right epididymis is nodular, firm, and tender Patient states this is due to a trauma several years ago

Rectal examination Prostate is enlarged, smooth, and regular Seminal vesicles palpable

The introduction of a small size Acorn sound (French No 12) meets an obstruction in the anterior extremity of the bulbous urethra Numerous attempts with a Banks bougie and filiform bougies fail to pass the obstruction Each one of these instrumentations has been followed by chill, temperature and more or less toxemia The last attempt was made two days ago and was followed by some swelling in the perineum and in the right side of the scrotum, evidently due to the slow leakage of urine into the tissues For this reason I have decided to operate on this patient today

There are only two types of stricture cases which require cutting operations, namely, the impassable stricture, of which this is a type, and those which are dense and fibrous and resist dilatation I will make an external urethrotomy without a guide, which changes the operation from one of the most simple in surgery to a rather difficult procedure

I will first introduce this grooved staff into the urethra down to the distal extremity of the stricture, which is in the anterior

Fig 134—*a* Median perineal incision exposing urethra containing grooved staff *b*, longitudinal incision on grooved staff, opening urethra *c* unsuccessful attempt to pass filiform bougie through strictured area.

part of the bulbous urethra. My incision is now made in the median line in the perineum (Fig 134, *a*), introducing the point of the knife into the groove of the staff and opening the urethra 1 cm anterior to its extremity (Fig 134, *b*). By now turning the staff around I will hook up with the end of it the anterior angle of the incision into the urethra, and by means of these two small hook-shaped retractors inserted into either side of the urethral incision I am able to expose the interior of the urethra. I will now try to pass this filiform bougie through the stricture (Fig 134, *c*). You will note that I cannot find any lumen here, so I will proceed to make a complete perineal section and expose the entire urethra back to the tip of the prostate.

Enlarging this skin incision to either side brings the central tendon of the perineum into view. I will cut this close to the urethra, and, by means of a careful dissection will cut the rectourethralis muscle, which you will note allows the rectum to drop back and exposes the tip of the prostate. I will now see if I can find any bulging of the urethra behind the proximal extremity of the stricture. If so, I will open the urethra here and attempt to pass a filiform retrograde through the stricture. I regret to say that I cannot see any bulging, but can feel this fibrous band which is the strictured urethra extending into the tip of the prostate. Not being able to find the lumen of the urethra here, I will rapidly make a suprapubic cystotomy. By the aid of my two fingers in the bladder I now introduce this sound in a retrograde manner into the prostatic urethra until it reaches the proximal end of the stricture. Now, retracting well the opening in the perineum I see the tip of the sound at the anterior extremity of the prostatic urethra, so I will open the urethra at this point. You will note that we now have an opening in the urethra at the distal end of the stricture, which is in the bulbous urethra, and another at its proximal extremity, which is at the tip of the prostate. I will now make a longitudinal incision between these two points (Fig 135, *d*), which is practically the obliterated urethra. I will introduce a catheter at the meatus of the urethra, passing it along into the prostatic urethra and well into the bladder, and you will note that this

catheter (Fig 135, *e*) fits into the groove made by the incised fibrous urethra. We will now close the wound in the perineum, putting in a small cigarette drain. I will close the suprapubic opening in the usual way, leaving a small tube in the bladder for drainage. I will allow this catheter to remain in place for about a week or ten days giving sufficient time for the tissues

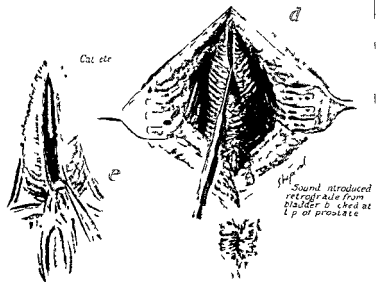


Fig 135 —*d* Incision being made along strictured part of urethra unting opened extremities of strictured urethra *e* introduction of catheter into bladder Exposed portion showing extent of incised stricture

to close in well about it and practically form a new urethra. I believe the mucous membrane eventually edges its way into this strictured area.

I have completely abandoned the use of implants in these cases of extensive stricture because in my own limited experience I have never had any success with them. Just how the repair in the urethra goes on after an extensive operation of this

kind I am not in a position to state, but the functional result is usually all that one can expect. Excision and anastomosis in a stricture as extensive as this could not be carried out.

A week after this catheter is removed I will introduce a sound at weekly intervals for a month. This should follow all cutting operations for stricture, it being the only means we have of preventing recurrence.

After-history.—You will note that both the suprapubic and perineal wounds are closed and I can pass this large sound without any difficulty into the bladder. The urinary function now is about normal.

BILATERAL COLON PYELITIS WITH CYSTITIS

Summary Difficulty of determining mode of invasion of kidney pelves
treatment by pelvic lavage demonstration of method

THE next case I wish to present belongs to a class which is rather commonly found in urologic practice

The patient is a married woman aged thirty She states that she had very good health until one year ago in September, when she had a threatened abortion at five months At that time pregnancy was terminated in the hospital and a very good recovery was made In September of this year she contracted a cold while menstruating Two or three days later she noticed blood in the urine in two or three specimens The blood apparently did not come from the vagina There was also frequency and burning on urination No further symptoms were experienced for one week At that time at 9 A M, just after getting up, she was seized with severe pain in the region of the navel, which was severe enough to double her up This continued for two hours the pain radiating to the back on both sides, which left tenderness in the abdomen and in the sides in the region of the flanks Following this she had chills and fever for two weeks After this the temperature disappeared and she got up In three days the temperature returned and has been present three to four days out of each week since There has been very little pain except in the right side, which becomes tender when she has a temperature At about ten years of age she had severe pain in the right side lasting three to four hours Another attack ten years ago lasted five to six hours Since then she has had similar attacks about twice a year Had one on street car, accompanied by cold sweats, vomiting, nausea, and severe pain All these attacks were similar to this last attack She thinks she has had no temperature with them

Physical examination Patient is an adult white woman, undernourished and pale

kind I am not in a position to state but the functional result is usually all that one can expect. Excision and anastomosis in a stricture as extensive as this could not be carried out.

A week after this catheter is removed I will introduce a sound at weekly intervals for a month. This should follow all cutting operations for stricture, it being the only means we have of preventing recurrence.

After history—You will note that both the suprapubic and perineal wounds are closed and I can pass this large sound without any difficulty into the bladder. The urinary function now is about normal.

this woman has suffered from a colitis for a long time. These cases are often protracted and difficult to clear up completely and permanently. I am going to practice a method of treatment here which we use in many cases of this type.

I will now introduce this double catheterizing cystoscope and allow the urine to drain out, and then thoroughly wash the bladder with warm sterile water. You will note that the return water is clear, so we will fill the bladder. Looking into the cystoscope I note that the bladder wall is hyperemic throughout otherwise nothing abnormal is to be seen. I will pass one of these catheters up each ureter into the kidney pelvis and allow them to drain for a short time. By means of this syringe and needle I will inject into each kidney pelvis some warm boric acid solution and allow this to drain out in other words washing out the kidney pelvis. We will then inject a 2 per cent solution of silver nitrate filling the kidney pelvis. We will draw out the catheters and remove the cystoscope from the bladder. This method of treatment can be repeated every four or five days. The patient will also be instructed to drink large quantities of water and will be given $\frac{1}{2}$ dram of urotropin and acid sodium phosphate four times a day. We do not consider these patients cured until we obtain urine from each kidney which is shown to be sterile by cultures. Not infrequently we find these patients during an attack of colon pyelitis run a very high temperature accompanied by a severe degree of toxemia. These attacks are often cut short by the introduction of ureteral catheters which are allowed to remain for a number of hours for the purpose of drainage.

Pupils are equal and react to light and accommodation. Teeth are in good condition and tonsils are negative

Chest Heart borders are normal. Rhythm is regular and no increase in rate, no murmurs. Lung borders normal. Chest expansion good, no dullness, no râles

Liver and spleen not palpable. Right rectus muscle seems distinctly more resistant to pressure than the left. Right kidney is palpable and somewhat tender, no further masses felt.

Patellar reflexes present. No edema of feet or ankles

Physical examination. Uterus is retroverted and cervix long, body of uterus not palpable

Urinalysis. Total quantity, 4000 c.c., appearance, clear, color, yellow, specific gravity, 1008, reaction, alkaline, no albumin, leukocytes present.

x-Ray of urinary tract negative

Cystoscopic examination. Bladder wall is slightly injected and red, mild cystitis. Ureteral orifices appear normal. Small white pus plug(?) seen in front of left ureteral orifice. Right kidney secretes about twice as fast as left

Cultures. Bladder, pus cells, 3200. *Bacillus coli*. Right kidney, pus cells, 200, *Bacillus coli*, left kidney, pus cells, 600 *Bacillus coli*.

From this history and these findings a diagnosis of bilateral infection of both kidney pelves and bladder by the colon bacillus is self-evident. This infection of the urinary tract in women is extremely common. However, in most cases it is not always easy to determine the origin of the infection. Authorities differ in their beliefs as to the routes by which this organism gains access to the urinary tract. Along these lines the following theories have been advanced

- 1 That the colon bacillus travels by way of the lymphatics from the colon to the kidney

- 2 That the infection travels by way of the blood-stream from a distant focus

- 3 That it ascends either by way of the urinary tract or by way of the lymphatics along the ureter

In this case the origin is apparently quite clear because

this woman has suffered from a colitis for a long time. These cases are often protracted and difficult to clear up completely and permanently. I am going to practice a method of treatment here which we use in many cases of this type.

I will now introduce this double catheterizing cystoscope and allow the urine to drain out and then thoroughly wash the bladder with warm sterile water. You will note that the return water is clear so we will fill the bladder. Looking into the cystoscope I note that the bladder wall is hyperemic throughout otherwise nothing abnormal is to be seen. I will pass one of these catheters up each ureter into the kidney pelvis and allow them to drain for a short time. By means of this syringe and needle I will inject into each kidney pelvis some warm boric acid solution and allow this to drain out in other words washing out the kidney pelvis. We will then inject a 2 per cent solution of silver nitrate filling the kidney pelvis. We will draw out the catheters and remove the cystoscope from the bladder. This method of treatment can be repeated every four or five days. The patient will also be instructed to drink large quantities of water and will be given $\frac{1}{2}$ dram of urotropin and acid sodium phosphate four times a day. We do not consider these patients cured until we obtain urine from each kidney which is shown to be sterile by cultures. Not infrequently we find these patients during an attack of colon pyelitis run a very high temperature accompanied by a severe degree of toxemia. These attacks are often cut short by the introduction of ureteral catheters which are allowed to remain for a number of hours for the purpose of drainage.

VASOTOMY IN A CASE OF PERSISTENT SEMINAL VESICULITIS

Summary A large percentage of gonorrheal infections of the male urethra ultimately involve the seminal vesicles infection in these vesicles is frequently the cause of the persistence of the infection importance of directing attention to these organs in cases which do not respond to the older methods of treatment the determination of cure

The history of this patient is as follows

He is twenty-seven years old Has had gonorrheal infection twice

Present complaint Swelling and tenderness of right testicle

Onset and course Six years ago, patient states, he had a Neisserian infection lasting six weeks, during which time he had treatment Infection cleared up without any involvement of the epididymes There was no morning drop following Three years ago he had a second infection, also lasting six to seven weeks, associated with no testicular swelling At the end of that time the discharge did not entirely disappear, leaving a morning drop This morning drop has persisted practically to date At times it is present for a week or more and then disappears for five or six weeks Prostatic massage and sounding has been done at intervals since About one month after disappearance of discharge (three years ago) patient states that right epididymus became swollen following massage of prostate and passage of a sound, which lasted for one week, the right testicle being swollen to a size approximating a clenched fist and accompanied by a temperature of 102° F Discharge absent during acute affair but appeared immediately thereafter Size of stream is as large as ever, no difficulty in starting Patient states that following excesses, no matter how mild, discharge is increased Two weeks ago patient noticed swelling in the right spermatic cord, and on the following day a swelling in right epididymus He can attribute it to no excesses of any kind



Fig. 136

Swelling has persisted to date Epididymis is about one half larger than left

Family Father died at fifty two of paralysis Mother and three sisters living and well

Physical examination Pupils equal and react to light and accommodation

Teeth Several fillings, apparently in good condition

Tonsils Slight hypertrophy

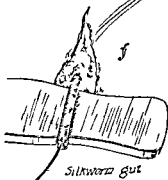
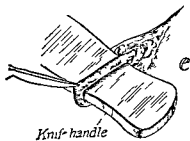
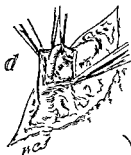
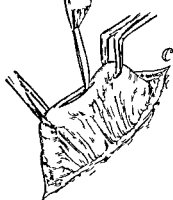
Chest Expansion good, lung borders normal, no dulness, no râles Apex beat is inside mammary line rhythm regular, no murmurs

Abdomen Negative

Genitalia Right testicle is swollen to twice the size of the left Epididymis seems to constitute majority of swelling Palpation in the rectum reveals a prostate but slightly enlarged However, both seminal vesicles are extremely large and hard, the right being the larger

On admission to the hospital a week ago the patient was placed in bed and the scrotum elevated by a sling and covered with a compress moistened with a saturated solution of magnesium sulphate The swelling in the epididymis has rapidly reduced in size and the pain and tenderness have entirely disappeared

It is evident from the history and examination of this case that this patient has had an infection going on in the lower extremity of his genital tract (seminal vesicles) for the last three years Also this like so many other cases of the same kind, is secondary to a gonorrheal infection of the urethra and has been the cause of the persistent urethral discharge It is also clear that excesses and manipulations, such as stripping and sounding have a tendency to produce an extension of the infection from the seminal vesicles along the vas and epididymis I am, therefore, satisfied that the only way to clean up this infection permanently is to direct our attention to the seminal vesicles This we will do by making a bilateral vasotomy this morning



I now pick up the cord and inject about it where it comes out of the external ring (Fig 136 *a*), a few cubic centimeters of $\frac{1}{2}$ per cent solution of apothesine. I will now infiltrate the skin of the anterolateral wall of the scrotum (Fig 136 *b*), beginning at the upper pole of the epididymis and extending up to the external ring. I make an incision along this line about $1\frac{1}{2}$ inches in length through the dartos exposing the cord. Isolating the vas from the rest of the cord I pick it up with these two forceps. I now dissect away the sheaths (Fig 137 *c*), exposing the vas proper (Fig 137 *d*) and make a small longitudinal incision into its lumen (Fig 137 *e*). This incision is not more than $\frac{1}{2}$ cm in length. I will introduce this strand of silkworm gut into the lumen of the vas (Fig 137 *f*) passing it up to the vesicle in this way testing its patency. Withdrawing the silkworm gut I will now introduce the point of this syringe (Fig 138 *h*) into the vas and inject into it a 3 per cent solution of collargol filling the vesicle (Fig 138, *g*). You will note that I readily pour 25 c c of this solution into the vesicle, which evidently more than fills it the overflow passing into the posterior urethra and bladder. In other words I practically irrigate the genital tract. It is well to keep the vas out of the scrotum for a few minutes, otherwise a small quantity of the collargol may return down the vas, producing a painful swelling which can be avoided by sponging off the collargol as it appears. The vas is now dropped back and the sheath closed by one catgut suture and the skin incision sutured in the usual way (Fig 138 *i*). I will repeat this performance on the other side. Some of this solution remains in the vesicle from a week or two to a month or more. Recently I had a patient report to me that he had a black seminal emission fifty nine days after a single injection with collargol. A dressing is now placed on either side of the scrotum which is supported by a Bevan triangular sling.

After history—This patient's wounds are now healed and

Fig 137—*c* Dissection of sheaths from vas *d* exposed vas picked up with forceps *e* minute incision into vas *f* passage of silkworm-gut along lumen of vas testing its patency

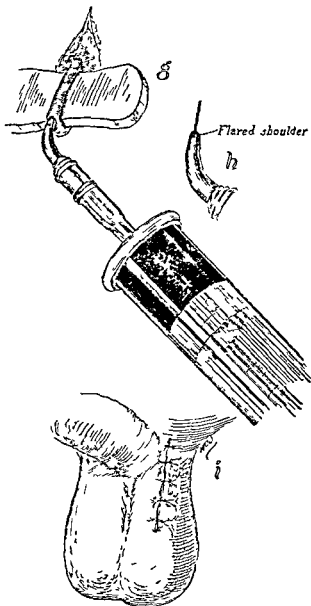


Fig 138.—g, Injection of collargol into vas & needle point used on Record syringe. Note shoulder which prevents back flow during injection
 s, incision in scrotum closed.

he will be subjected to the usual tests to determine that the infection in the vesicles has terminated. This is accomplished by examining several expressed smears both with and without silver nitrate provocation and examination of at least one ejaculated specimen of semen. This operation is not infallible but it is successful in a good proportion of these cases which in the past we have not been able to relieve by the older methods.

Practice, Pharmacy, Materia Medica, Thera- peutics, Pharmacology, and the Allied Sciences

W. B. SAUNDERS COMPANY

WEST WASHINGTON SQUARE PHILADELPHIA

9, HENRIETTA STREET, COVENT GARDEN, LONDON

Carman & Miller's X-ray Diagnosis

Röntgenology of the Gastro-intestinal Tract By RUSSELL D. CARMAN M. D. Head of Section on Röntgenology and ALBERT MILLER A. B. M. D. Second Assistant in Section on Röntgenology, Division of Medicine in The Mayo Clinic Rochester, Minnesota. Octavo of 550 pages with 504 illustrations. Published May 1917. Cloth \$6.00 net.

COMPREHENSIVE IN DETAIL

This work takes up the diagnosis of disease of the alimentary tract

by systematic and exhaustive treatment of individual variations and an extensive bibliography on every topic. A few of the important topics treated are early cancer, diverticula, gastroptosis, hanger pain, duodenal ulcer, Lanes's kinks.

Our books are revised frequently, so that the editions you find here may not be the latest. Write us about any books in which you are interested.

A NEW CLINICAL PUBLICATION

The Medical Clinics of North America

Issued serially one octavo of 225 pages illustrated every other month.
Sold only by the Clinic Year (July to May) six volumes Cloth \$14.00
net, Paper \$10.00 net

In THE MEDICAL CLINICS OF NORTH AMERICA you will find a
postgraduate course of unusual interest and value from
the great medical centers of the world. Each volume devoted
to a special subject.

The Baltimore Number (Johns Hopkins Hospital)

Dr Theodore C Janeway
Dr Lewellys F Barker

Dr Herman C Mosenthal
Dr Thomas R Brown

Dr Louis Hamman
Dr Thomas B Fletcher

The Philadelphia Number (University of Pennsylvania and Jefferson Medical College)

Dr Alfred Stengel
Dr Joseph Sailer
Dr A A Stevens
Dr John H Musser Jr
Dr O H P Pepper

Dr Thomas McCrae
Dr Hobart A. Hare
Dr Elmer H Funk
Dr Martin E. Rehfuess
Dr Ross A Patterson
Dr John A Kolmer

Dr Theo H Weisenburg
Dr Judson Daland
Dr Henry K. Pancoast
Dr Jay Frank Schamberg
Dr David Riesman

The New York Number (Columbia Bellevue Cornell and Post-Graduate Schools Presbyterian St Luke's Post Graduate New York Mt Sinai, and Bellevue Hospital.)

Dr W T Longcope
Dr Homer Swift
Dr Henry R Gevelin
Dr Samuel W Lambert
Dr L F Frissell
Dr W A Bastedo

Dr Arthur F Chase
Dr Ed Quintard
Dr Ludwig Kaetzel
Dr Louis A. Conner
Dr W R Williams

Dr Emmanuel Libman
Dr Harlow Brooks
Dr Malcolm Goodridge
Dr Alfred Hess
Dr Frederick Tilney
Dr Marcus A. Rothchild

The Boston Number will include Harvard Massachusetts General Hospital Boston City Hospital and Peter Bent Brigham Hospital

The Chicago Number will include the institutions familiar to our subscribers through the Chicago Clinics.

Goepp's Medical State Boards

Fourth Edition published March, 1917

STATE BOARD QUESTIONS AND ANSWERS. By R. MAX GOEPP M D Professor of Clinical Medicine Philadelphia Polyclinic Octavo of 23 pages. Cloth, \$4.25 net.

This book will help you to pass any State Board Examination, those for army and navy appointments, etc. Also a quick reference work. For instance you want to know the technique of the Wassermann-Noruchi Reaction or of the "606" treatment of syphilis. The complete index gives you the page, and in an instant you have before you definite, concise descriptions.

"Nothing has been printed which is so admirably adapted as a guide and self-test for those intending to take the State Board Examinations."—*Pennsylvania Medical Journal*.

Cabot's Works on Diagnosis

Differential Diagnosis Presented through an Analysis of Cases
By RICHARD C CABOT M D Assistant Professor of Clinical Medicine Harvard Medical School, Boston Each volume an octavo of about 750 pages illustrated Per volume Cloth \$6.00 net

Dr Cabot's work takes up diagnosis from the point of view of the *presenting symptom*—the symptom in any disease which holds the foreground in the clinical picture the principal complaint It groups diseases under these symptoms and points the way to proper reasoning in coming to a correct diagnosis It works backward from each leading symptom to the actual organic cause of the symptom This the author does by means of *case teaching*

The *symptoms group* in Volume I (Third Edition—January 1915) are Headache general abdominal pain epigastric pain right hypochondriac pain left hypochondriac pain right iliac pain left iliac pain axillary pain pain in arms pain in legs and feet fevers chills coma convulsions weakness cough vomiting hēnaturia dyspnea jaundice and nervousness—21 symptoms and 385 cases

Volume II (Second Edition—February 1918) Abdominal and other tumors, vertigo, diarrhea dyspepsia hematemesis enlarged glands blood in stools swelling of face, hemoptysis edema of legs frequent micturition and polyuria fainting hoarseness pallor swelling of arm delirium palpitation and arrhythmia tremor ascites and abdominal enlargement—a total of 19 symptoms and 317 instructive cases

Morrow's Diagnostic and Therapeutic Technic

Diagnostic and Therapeutic Technic. By ALBERT S MORROW, M D Clinical Professor of Surgery New York Polyclinic Octavo of 834 pages, with 860 original line drawings Cloth, \$6.00 net

SECOND EDITION

Dr Morrow's new work is decidedly a work for you—the physician engaged in general practice It is a work you need because it tells you just how to perform those procedures required of you every day, and it tells you and *shows* you by clear *new* line drawings in a way never before approached. It is not a book on drug therapy it deals alone with physical or mechanical diagnostic and therapeutic measures The information it gives is such as you need to know every day—transfusion and infusion hypodermic medication Bier's hyperemia exploratory punctures aspirations anesthesia etc Then follow descriptions of those measures employed in the diagnosis and treatment of diseases of special regions or organs proctoclysis cystoscopy etc
Journal American Medical Association

The procedures described are those which practitioners may at some time be called on to perform.

Published January 1915

Musser and Kelly on Treatment

Practical Treatment. By 108 eminent specialists Volumes I, II, and III edited by JOHN H. MUSSER, M. D., and A. O. J. KELLY, M. D. Each an octavo of 950 pages, illustrated. Cloth \$6.00 net, Half Morocco \$6.50 net. Volume IV, edited by JOHN H. MUSSER, JR., M. D., and THOMAS C. KELLY, M. D. Octavo of 990 pages, illustrated. Cloth, \$7.00 net. Published May, 1917 Subscription

VOLUME IV—All the New Treatments—JUST OUT

With Musser and Kelly's Treatment within arm's reach you have at your instant command the combined experience and teachings of 108 leading internists and specialists of America and England. In many cases you get the *actual prescriptions* used by these authorities. The past few years have seen radical developments in medicine—it is these new developments that constitute the subject matter of *Volume II*. Bacteriology, the endocrine glands, serum therapy, synthetic chemistry, new surgical and non-medical treatments—these are only a few of the subjects covered. Remember Musser and Kelly's Treatment covers the *entire field*. It is a Treatment that will give you more service—*better service*—than any other.

Thomson's Clinical Medicine

Clinical Medicine. By WILLIAM HANNA THOMSON, M. D., LL. D., formerly Professor of the Practice of Medicine and of Diseases of the Nervous System, New York University Medical College. Octavo of 678 pages. Cloth \$5.50 net. Published January 1913

SECOND EDITION

This new work represents over a half century of active practice and teaching. It deals with *bedside medicine*—the application of medical knowledge for the relief of the sick. First the meaning of common and important symptoms is explained definitely, then follows a chapter on the use of remedies and a classifi-

Ward's Bedside Hematology

Bedside Hematology. By GORDON R. WARD, M.D., Fellow of the Royal Society of Medicine, London England. Octavo of 394 pages, illustrated. Published April 1914. Cloth \$3.50 net.

INCLUDING VACCINES AND SERUMS

Dr. Ward's work gives you the exact technic for obtaining the blood for examination the making of smears the blood count finding coagulation time etc. Then it takes up each disease giving you the synonyms definition nature general pathology etiology bearings of age and sex the onset symptomatology (discussing each symptom *in detail*) course of the disease clinical varieties complications diagnosis and treatment (drug diet rest *vaccines and serums* etc.)

Faught's Blood-Pressure

Blood-Pressure from the Clinical Standpoint. By FRANCIS A. FAUGHT, M.D., formerly Instructor in Medicine Medico-Chirurgical College of Philadelphia. Octavo of 475 pages, illustrated. Cloth, \$3.50 net.

SECOND EDITION—published November 1916

Dr. Faught's book is designed for practical help *at the bedside*. Besides the actual technic of using the sphygmomanometer in diagnosing disease Dr. Faught has included a brief general discussion of the process of circulation. The practical application of sphygmomanometric findings within recent years make it imperative for every medical man to have close at hand an up to date work on this subject.

Smith's What to Eat and Why

What to Eat and Why. By G. CARROLL SMITH, M.D., Boston. 12mo of 377 pages. Cloth, \$2.75 net. Published September, 1915.

SECOND EDITION

With this book you no longer need send your patients to a specialist to be dieted—you will be able to prescribe the suitable diet yourself just as you do other forms of therapy. Dr. Smith gives the *why* of each statement he makes. It is this knowing *why* which gives you confidence in the book which makes you feel that Dr. Smith *knows*.

Pennsylvania Medical Journal

All through this book Dr. Smith has added to his dietetic hints a great many valuable ones of a general nature which will appeal to the general practitioner.

Kolmer's Specific Therapy

Infection, Immunity, and Specific Therapy By JOHN A. KOLMER, M. D., DR. P. H., Assistant Professor of Experimental Pathology, University of Pennsylvania. Octavo of 977 pages with 147 original illustrations, 46 in colors, drawn by Erwin F. Faber. Cloth, \$7.00 net.

Second Edition published October 1917

ORIGINAL ILLUSTRATIONS

Dr. Kolmer's book gives you a full account of infection and immunity and the application of this knowledge in the specific diagnosis, prevention and treatment of disease. The section devoted to *immunologic technic* gives you every detail from the care of the centrifuge and making a simple pipet to the actual production of serums and vaccines. Under *specific therapy* you get methods of making *autogenous vaccines* and their *actual use* in diagnosis and treatment. The directions for injecting vaccines, serums, salvarsan, etc.—with the *exact dosage*—are here given so clearly that you will be able to use these means of treatment in your daily practice. You also get full directions for making the *clinical diagnostic reactions*—the various tuberculin tests, luetin, mallein, and similar reactions, all illustrated with *colored plates*. The final section is devoted to *laboratory experiments*.

Anders & Boston's Medical Diagnosis

(Published July 1914)

A Text-Book of Medical Diagnosis By JAMES M. ANDERS, M. D., PH. D., LL. D., Professor of Medicine and L. NAPOLEON BOSTON, M. D., Professor of Physical Diagnosis, Medico-Chirurgical College Graduate School of Medicine, University of Pennsylvania. Octavo of 1248 pages with 466 illustrations. Cloth, \$6.00 net.

SECOND EDITION

This new edition is designed expressly for the general practitioner. The methods given are practical and especially adapted for quick reference. The diagnostic methods are presented in a forceful, definite way by men who have had wide experience at the bedside and in the clinical laboratory.

The Medical Record

The association in its authorship of a celebrated clinician and a well-known laboratory worker is most fortunate. It must long occupy a pre-eminent position.

Anders' Practice of Medicine

A Text-Book of the Practice of Medicine. By JAMES M. ANDERS, M. D., PH. D., LL. D., Professor of Medicine, Medico Chirurgical College Graduate School, University of Pennsylvania Thirteenth Edition, with the assistance of JOHN H. MUSSER, JR., B. S., M. D. Associate in Medicine, University of Pennsylvania Handsome octavo, 1259 pages, fully illustrated Cloth, \$6.00 net
Published October, 1917

The success of this work is no doubt due to the extensive consideration given to Diagnosis and Treatment under Differential Diagnosis the points of distinction of simulating diseases being presented in tabular form In this new edition Dr Anders has included all the most important advances in medicine keeping the book within bounds by a judicious elimination of obsolete matter A great many articles have also been rewritten

Wm. E. Quine, M. D.,

Professor of Medicine and Clinical Medicine College of Physicians and Surgeons Chicago

I consider Anders' Practice one of the best single volume works before the profession at this time and one of the best text books for medical students

DaCosta's Physical Diagnosis

Physical Diagnosis By JOHN C. DACOSTA, JR., M. D., Associate Professor of Medicine Jefferson Medical College, Philadelphia Octavo of 589 pages with 243 original illustrations Cloth, \$3.50 net

THIRD EDITION—published November, 1915

Dr DaCosta's work is a thoroughly new and original one Every method given has been carefully tested and proved of value by the author himself Normal physical signs are explained in detail in order to aid the diagnostician in determining the abnormal Both direct and differential diagnosis are emphasized. The cardinal methods of examination are supplemented by full descriptions of technique and the clinical utility of certain instrumental means of research

Dr Henry L. Elmer, Professor of Medicine at Syracuse University

I have reviewed this book and am thoroughly convinced that it is one of the best ever written on this subject In every way I find it a superior production

Norris & Landis' Diseases of the Chest and Physical Diagnosis

Diseases of the Chest and the Principles of Physical Diagnosis By **GEORGE WILLIAM NORRIS, A. B., M. D.** Associate in Medicine at the University of Pennsylvania and **H. R. M. LANDIS, A. B., M. D.**, Director of Clinical and Sociological Department of the Phipps Institute, Philadelphia. Octavo of 782 pages, with 413 illustrations, mostly original. Cloth, \$7.00 net.

Published August, 1917

STRONG ON INTERPRETATION

This work presents an admirable combination of the theory and applications of physical diagnosis. It is complete down to the last detail. The first part takes

Friedenwald and Ruhrah on Diet

Diet in Health and Disease By **JULIUS FRIEDENWALD, M. D.**, Professor of Diseases of the Stomach and **JOHN RUHRAH, M. D.** Professor of Diseases of Children, College of Physicians and Surgeons, Baltimore. Octavo of 857 pages. Published July 1913. Cloth \$4.00 net.

FOURTH EDITION

This new edition has been carefully revised, making it still more useful than the two editions previously exhausted. The articles on milk and alcohol have been rewritten, additions made to those on tuberculosis, the salt free diet and rectal feeding and several tables added, including Winton's, showing the composition of diabetic foods.

George Dock, M. D.

Professor of Theory and Practice and of Clinical Medicine, Tulane University

"It seems to me that you have prepared the most valuable work of the kind now available. I am especially glad to see the long list of analyses of different kinds of foods."

Carter's Diet Lists

DIET LISTS OF THE PRESBYTERIAN HOSPITAL OF NEW YORK CITY Compiled, with notes, by **HERBERT S. CARTER, M. D.** 11mo of 119 pages. Published May 1913. Cloth \$1.00 net.

Here Dr. Carter has compiled all the diet lists for the various diseases and for convalescence as prescribed at the Presbyterian Hospital. Recipes are also included.

Kemp on Stomach, Intestines, and Pancreas

Diseases of the Stomach, Intestines, and Pancreas. By ROBERT COLEMAN KEMP, M D, Professor of Gastro intestinal Diseases at the New York School of Clinical Medicine Octavo of 1096 pages with 428 illustrations Cloth \$7 00 net.

NEW (3d) EDITION—published April 1917

The new edition of Dr Kemp's successful work appears after a most searching revision. Several new subjects have been introduced notably chapters on *Colon Bacillus Infection* and on *Diseases of the Pancreas* the latter article being really an exhaustive monograph covering over one hundred pages. The section on *Duodenal Ulcer* has been entirely rewritten. *Visceral Displacements* are given special consideration in every case giving definite indications for surgical intervention when deemed advisable. There are also important chapters on the *Intestinal Complications of Typhoid Fever* and on *Diverticulitis*.

The Therapeutic Gazette

The therapeutic advice which is given is excellent. Methods of physical and clinical examination are adequately and correctly described.

Gant on Diarrheas

Diarrheal, Inflammatory, Obstructive, and Parasitic Diseases of the Gastro-intestinal Tract. By SAMUEL G GANT M D, LL D, Professor of Diseases of Sigmoid Flexure Colon Rectum and Anus, New York Post graduate Medical School and Hospital Octavo of 604 pages 181 illustrations Cloth, \$6 00 net

ILLUSTRATED

This new work is particularly full on the two practical phases of the subject—*diagnosis* and *treatment*. For instance While the essential diagnostic points are given under each disease a fuller description of diagnostic methods is given in a special chapter. The *differential diagnosis* of diarrheas of local and those of systemic disturbances is strongly brought out. There is a special chapter on *ner*

Gant on Constipation and Obstruction

This work is medical non medical (mechanical) and surgical the latter really being a complete work on rectocolonic surgery. Second Edition October 1916 Octavo of 575 pages with 250 illustrations By SAMUEL G GANT M D Cloth \$6 00 net.

Sollmann's Pharmacology

A Manual of Pharmacology: ITS APPLICATIONS TO THERAPEUTICS AND TOXICOLOGY. By TORALD SOLLMANN, M. D., Professor of Pharmacology and Materia Medica in the School of Medicine of Western Reserve University, Cleveland. Octavo of 901 pages, illustrated. Cloth, \$4.50 net.

Published February, 1917

JUST OUT—BASED ON THE 1916 U. S. PHARMACOPOEIA

MANUAL. This is the text or reference volume. Two sizes of type are used. The broad conceptions, the generalizations and those detailed discussions of great and practical value to practitioner and student are set in the large type. The mass of minute details is set in the smaller type with frequent side headings to facilitate quick reference. Throughout the work the relation of pharmacology to the practice of medicine is forcibly emphasized. The really important drugs—those drugs that you actually use in your practice—are discussed extensively while those used less frequently are dismissed with less consideration. All the new remedies are included with detailed instructions for their use. Vaccines, serums, salvarsan, neosalvarsan, pituitary extract, emetin—all those new remedies of the Pharmacopoeia being so extensively discussed and employed. Every worthwhile development in the field of pharmacology is included.

LABORATORY GUIDE. The exercises in this *Laboratory Guide* present no difficulty in technic and require little help from the instructor. They teach you how to teach yourself. Special stress is laid on facts with direct practical bearing.

A Laboratory Guide in Pharmacology By TORALD SOLLMANN, M. D. Octavo of 315 pages, illustrated. Cloth, \$1.50 net.

Sollmann's Actions of Drugs

The Actions of Drugs: A COURSE OF ELEMENTARY LECTURES FOR STUDENTS OF PHARMACY. By TORALD SOLLMANN, M. D. 12mo of 213 pages. Cloth, \$1.50 net.

Published October, 1917

Arny's Pharmacy

Principles of Pharmacy By HENRY V. ARNY, PH. D., Professor of Chemistry, New York College of Pharmacy. Octavo of 1056 pages, with 246 illustrations. Cloth, \$5.50 net.

SECOND EDITION—published March, 1917

The first part deals with pharmacy, the second with the history of pharmacy, the third with the general principles of pharmacy, the fourth discusses the organic chemicals, the fifth is devoted to chemical testing, presenting a systematic grouping of all the tests of the Pharmacopoeia, the sixth discusses the prescription from the time it is written until it is dispensed, the seventh is devoted to laboratory work, with exercises in equation writing and chemical arithmetic.

Bastedo's Materia Medica

Pharmacology, Therapeutics, Prescription Writing

Materia Medica Pharmacology, Therapeutics, and Prescription Writing By W A BASTEDO PH G M D Assistant Professor of Clinical Medicine Columbia University, New York Octavo of 654 pages illustrated Cloth \$4.00 net

SECOND EDITION REVISED AND RESET

Dr Bastedo's discussion of his subject is very complete. As an illustration take the pharmacologic action of the drug. It gives you the antiseptic action, the local action on the skin, mucous membranes, and the alimentary tract, where the

tolerance—habit formation. Could any discussion be more complete, more thorough?

Boston Medical and Surgical Journal

It is a gem throughout its therapeutic and practical rather than theoretical and pharmacologic. The text is illustrated with sixty well-chosen plates and cuts. It should prove a useful contribution to the text book literature on these subjects.

McKenzie on Exercise in Education and Medicine

Exercise in Education and Medicine By R TAIT MCKENZIE B A, M D Professor of Physical Education and Director of the Department University of Pennsylvania Octavo of 585 pages with 478 original illustrations Cloth \$4.00 net

SECOND EDITION—published June 1915

D A Sargeant M D Director of Hemenway Gymnasium Harvard University

I cannot fail to be helpful to practitioners in medicine. The classification of athletic games and exercises in tabular form for different ages, sexes, and occupations is the work of an expert. It should be in the hands of every physical educator and medical practitioner.

Bonney's Tuberculosis

Second Edition

TUBERCULOSIS By SHERMAN G BONNEY M D Professor of Medicine Denver and Gross College of Medicine Octavo of 955 pages with 243 illustrations Cloth \$7.00 net Half Morocco \$8.50 net

Maryland Medical Journal

Dr Bonney's book is one of the best and most exact works on tuberculosis in all its aspects that has yet been published.

Published May 1910

Sollmann's Pharmacology

A Manual of Pharmacology: ITS APPLICATIONS TO THERAPEUTICS AND TOXICOLOGY. By TORALD SOLLMANN, M D, Professor of Pharmacology and Materia Medica in the School of Medicine of Western Reserve University, Cleveland. Octavo of 901 pages, illustrated. Cloth, \$4 50 net.

Published February 1917

JUST OUT—BASED ON THE 1916 U. S. PHARMACOPOEIA

MANUAL. This is the text or reference volume. Two sizes of type are used. The broad conceptions the generalizations and those detailed discussions of great and practical value to practitioner and student are set in the large type. The mass of minute details is set in the smaller type with frequent side headings to facilitate quick reference. Throughout the work the *relation of pharmacology to the practice of medicine* is forcibly emphasized. The really important drugs—those drugs that you actually use in your practice—are discussed extensively while those used less frequently are dismissed with less consideration. All the new remedies are included with detailed instructions for their use. Vaccines serums salvarsan neosalvarsan pituitary extract, emetin—all those new remedies of the Pharmacopoeia being so extensively discussed and employed. Every worthwhile development in the field of pharmacology is included.

LABORATORY GUIDE. The exercises in this *Laboratory Guide* present no difficulty in technic and require little help from the instructor. They teach you how to *teach yourself*. Special stress is laid on facts with direct practical bearing.

A Laboratory Guide in Pharmacology By TORALD SOLLMANN, M D. Octavo of 355 pages illustrated. Cloth, \$1 50 net.

Sollmann's Actions of Drugs

The Actions of Drugs; A COURSE OF ELEMENTARY LECTURES FOR STUDENTS OF PHARMACY. By TORALD SOLLMANN, M D. 12mo of 213 pages. Cloth, \$1 50 net.

Published October, 1917

Arny's Pharmacy

Principles of Pharmacy. By HENRY V ARNY, PH D. Professor of Chemistry, New York College of Pharmacy. Octavo of 1056 pages, with 246 illustrations. Cloth, \$5 50 net.

SECOND EDITION—published March, 1917

unofficial preparations as per U. S. P. including the theories of chemistry the fourth discusses the organic chemicals the fifth is devoted to chemical testing presenting a systematic grouping of all the tests of the Pharmacopoeia the sixth discusses the prescription from the time it is written until it is dispensed the seventh is devoted to laboratory work with exercises in equation writing and chemical arithmetic

Bastedo's Materia Medica

Pharmacology, Therapeutics, Prescription Writing

Materia Medica, Pharmacology, Therapeutics, and Prescription Writing. By W A BASTEDO, PH G, M D, Assistant Professor of Clinical Medicine, Columbia University, New York Octavo of 654 pages, illustrated Cloth, \$4.00 net

SECOND EDITION, REVISED AND RESET

Dr Bastedo's discussion of his subject is very complete. As an illustration, take the pharmacologic action of the drug. It gives you the antiseptic action, the local action on the skin, mucous membranes, and the alimentary tract, where the

thorough?

Boston Medical and Surgical Journal

Its aim throughout is therapeutic and practical rather than theoretic and pharmacologic. The text is illustrated with sixty well-chosen plates and cuts. It should prove a useful contribution to the text book literature on these subjects.

McKenzie on Exercise in Education and Medicine

Exercise in Education and Medicine. By R TAIT MCKENZIE, B A, M D Professor of Physical Education and Director of the Department, University of Pennsylvania Octavo of 585 pages, with 478 original illustrations Cloth \$4.00 net

SECOND EDITION—published June, 1915

D. A. Sargeant, M. D., *Director of Hemenway Gymnasium, Harvard University*

It cannot fail to be helpful to practitioners in medicine. The classification of athletic games and exercises in tabular form for different ages, sexes, and occupations is the work of an expert. It should be in the hands of every physical educator and medical practitioner.

Bonney's Tuberculosis

Second Edition

TUBERCULOSIS. By SHERMAN G. BONNEY, M D, Professor of Medicine, Denver and Gross College of Medicine Octavo of 955 pages, with 243 illustrations Cloth \$7.00 net, Half Morocco, \$8.50 net

Maryland Medical Journal

Dr Bonney's book is one of the best and most exact works on tuberculosis in all its aspects that has yet been published. Published May, 1910

Garrison's History of Medicine

History of Medicine With Medical Chronology, Bibliographic Data, and Test Questions By FIELDING H. GARRISON, M. D., Principal Assistant Librarian, Surgeon General's Office, Washington, D. C.
Cloth, \$7.00 net

Second Edition published June, 1917

THE BAEDER OF MEDICAL HISTORY

The work begins with ancient and primitive medicine and carries you in a most interesting and instructive way on through Egyptian medicine, Sumerian and Oriental medicine, Greek medicine, the Byzantine period, the Mohammedan and the Renaissance, the eighteenth Century (the age of medicine), the nineteenth Century (the age of theories and organized advancement of science), the Twentieth Century (the beginning of organized preventive medicine). You get all the important facts in medical history, a *biographic dictionary*, an album of *medical portraits*, and a complete *medical chronology*.

Stevens' Therapeutics

Fifth Edition, September, 1909

A TEXT BOOK OF MODERN MATERIA MEDICA AND THERAPEUTICS. By A. A. STEVENS, A. M., M. D., Lecturer on Physical Diagnosis in the University of Pennsylvania. Octavo of 673 pages. Cloth \$3.50 net.

Dr. Stevens' Therapeutics is one of the most successful works on the subject ever published. In this new edition the work has undergone a very thorough revision and now represents the very latest advances.

The Medical Record, New York

Among the numerous treatises on this most important branch of medical practice, this by Dr. Stevens has ranked with the best.

Butler's Materia Medica

Sixth Edition

A TEXT BOOK OF MATERIA MEDICA, THERAPEUTICS, AND PHARMACOLOGY. By GEORGE F. BUTLER, PH. G., M. D., Professor and Head of the Department of Therapeutics and Professor of Preventive and Clinical Medicine, Chicago College of Medicine and Surgery, Medical Department Valparaiso University. Octavo of 702 pages, illustrated. Cloth, \$4.00 net, Half Morocco, \$5.50 net. Published June 1908.

For this sixth edition Dr. Butler has entirely remodeled his work, a great part having been rewritten. All obsolete matter has been eliminated and special attention has been given to the toxicologic and therapeutic effects of the newer compounds.

Medical Record, New York

"Nothing has been omitted by the author which, in his judgment, would add to the completeness of the text."

Tousey's Medical Electricity Röntgen Rays, and Radium

Medical Electricity, Röntgen Rays, and Radium By SINCLAIR
TOUSEY M. D., Consulting Surgeon to St. Bartholomew's Hospital
New York. Octavo of 1219 pages with 801 illustrations 19 in colors
Cloth \$7.50 net

Published February 1913

SECOND EDITION RESECT

The revision for this edition was extremely heavy. New matter has increased the size of the book by some 100 pages. About 50 new illustrations have been added. The new matter added includes Daffinomy, a muscular tremor radiographs with tensing screens, röntgenotherapy, the Coolidge x-ray tube, Röntgen tubes and the author's method of dosage and radium therapy are noted. The book also includes including several of Machado's tabular classifications of electrical effects and uses.

Throughout the entire work everything concerning electricity, x-rays, and radium in medicine as well as phototherapy is explained in detail—nothing is left out. It tells you how to equip your office and more than that, how to use your apparatus explaining away all difficulties. It tells you just how to apply the electric measures in the treatment of disease. The chapters on *dental radiography* are particularly valuable to those interested in dental work.

Deaderick & Thompson's Endemic Diseases of South

Endemic Diseases of the Southern States By WILLIAM H.
DEADERICK M. D. Member American Society of Tropical Medicine,
and LOYD THOMPSON M. D. Charter Member American Association
of Immunologists. Octavo of 546 pages illustrated. Cloth \$5.00
net

Published March 1916

THE ONLY WORK OF ITS KIND

This work records the experiences of two active practitioners and teachers right in the field and thoroughly familiar with the diseases. Those diseases of special importance are given unusual consideration. *Plague* for instance is given eight chapters for its full consideration while *hookworm disease* covers nine chapters and *malaria* eight. You get the etiology, pathology, clinical history, diagnosis, prognosis, prophylaxis and treatment of each disease presented from every angle always bearing in mind the practical aim of the work—the application of the knowledge in daily practice.

Garrison's History of Medicine

History of Medicine With Medical Chronology, Bibliographic Data and Test Questions By FIELDING H. GARRISON, M. D., Principal Assistant Librarian, Surgeon General's Office, Washington, D. C. Cloth, \$7.00 net. Second Edition published June 1917

THE BAEDER OF MEDICAL HISTORY

The work begins with ancient and primitive medicine and carries you in a most interesting and instructive way on through Egyptian medicine, Sumerian medicine, Greek medicine, the Byzantine period, the Mohammedan systems, the Nineteenth Century (the beginning of organized advancement of science), the Twentieth Century (the beginning of organized preventive medicine). You get all the important facts in medical history, a *biographic dictionary*, an album of *medical portraits*, and a complete *medical chronology*.

Stevens' Therapeutics

Fifth Edition September 1909

A TEXT BOOK OF MODERN MATERIA MEDICA AND THERAPEUTICS By A. A. STEVENS, A. M., M. D., Lecturer on Physical Diagnosis in the University of Pennsylvania. Octavo of 675 pages. Cloth \$3.50 net.

Dr. Stevens' Therapeutics is one of the most successful works on the subject ever published. In this new edition the work has undergone a very thorough revision and now represents the very latest advances.

The Medical Record, New York

"Among the numerous treatises on this most important branch of medical practice this by Dr. Stevens has ranked with the best."

Butler's Materia Medica

Sixth Edition

A TEXT BOOK OF MATERIA MEDICA, THERAPEUTICS AND PHARMACOLOGY By GEORGE F. BUTLER, Ph. G., M. D., Professor and Head of the Department of Therapeutics and Professor of Preventive and Clinical Medicine, Chicago College of Medicine and Surgery, Medical Department Valparaiso University. Octavo of 702 pages, illustrated. Cloth, \$4.00 net, Half Morocco, \$5.50 net. Published June 1908

For this sixth edition Dr. Butler has entirely remodeled his work, a great part having been rewritten. All obsolete matter has been eliminated, and special attention has been given to the toxicologic and therapeutic effects of the newer compounds.

Medical Record, New York

"Nothing has been omitted by the author which in his judgment would add to the completeness of the text."

The American Pocket Medical Dictionary

New 10th Edition

THE AMERICAN POCKET MEDICAL DICTIONARY Edited by W. A. NEWMAN DORLAND M. D. E. or American Illustrated Medical Dictionary 1071 pages Flexible leather with gold edges \$1.25 net with index \$1.50 net October 1917

Strouse & Perry's Food Manual for Doctor and Patient

A FOOD MANUAL FOR DOCTOR AND PATIENT By SOLOMON STROUSE A. B. M. D. Professor of Medicine Post Graduate Medical School Chicago and MAUDE A. PERRY B. S. Dietitian Michael Reese Hospital 12mo of 20 pages Cloth \$1.50 net. Published August 1917

Here the science of nutrition is detailed for the layman and the physician finds his abstract theories translated into the terminology of the kitchen. Diets are given for diabetes (starvation treatment) gout nephritis high blood pressure kidney stones diseases of the stomach intestines liver gall stones tuberculosis fevers skin affections obesity anemia etc. There are in all 232 diets and menus and 124 special recipes.

Cohen and Eshner's Diagnosis

Second Revised Edition 1900

ESSENTIALS OF
CLINICAL
PROCESSES OF
DIAGNOSIS

Morris' Materia Medica and Therapeutics

Seventh Edition

ESSENTIALS OF MATERIA MEDICA THERAPEUTICS AND PRESCRIPTION WRITING

Kelly's Cyclopedia of American Medical Biography

CYCLOPEDIA OF AMERICAN MEDICAL BIOGRAPHY By HORACE A. KELLY M. D. Johns Hopkins University Two volumes of 525 pages each with portrait plates Cloth \$4.00 net Half Morocco \$13.00 net Published April 1912

Oertel on Bright's Disease

Illustrated

THE ANATOMIC HISTOLOGICAL PROCESSES OF BRIGHT'S DISEASE By HORST OERTEL M. D. Director of the Rudolf Säge Institute of Pathology New York October of 227 pages with 44 text-cuts and 6 colored plates Cloth \$5.00 net December 1910

Arnold's Medical Diet Charts

MEDICAL DIET CHARTS Prepared by H. D. ARNOLD M. D. Dean of Harvard Graduate Medical School Boston Single charts 5 cents 50 charts \$2.00 net 500 charts \$18.00 net 1000 charts \$30.00 net

Eggleston's Prescription Writing

ESSENTIALS OF PRESCRIPTION WRITING By CARY EGGLESTON M. D. Instructor in Pharmacology Cornell University Medical College 16mo of 134 pages Cloth \$1.25 net Second Edition published November 1917

GET
THE BEST

American

THE NEW
STANDARD

Illustrated Dictionary

New (9th) Edition—2000 New Words

The American Illustrated Medical Dictionary By W A NEW-
MAN DORLAND, M D, Editor of 'The American Pocket Medical Dic-
tionary' Large octavo of 1179 pages, bound in full flexible leather
Price \$5 00 net, with thumb index, \$5 50 net. Published October 1917

KEY TO CAPITALIZATION AND PRONUNCIATION—ALL THE NEW WORDS

Howard A. Kelly, M.D., *Professor of Gynecologic Surgery, Johns Hopkins University*

"Dr Dorland's dictionary is admirable. It is so well gotten up and of such convenient size. No errors have been found in my use of it."

Thornton's Dose-Book.

Fourth Edition

By E Q THORNTON M D.,
College, Philadelphia. Post
Published September 1909

I will be able to make considerable use of that part of its contents relating to the correct terminology as used in prescription writing and it will afford me much pleasure to recommend the book to my classes, who often fail to find this information in their other text books. —C. H. MILLER M D *Professor of Pharmacology Northwestern University Medical School*

Lusk's Food in War Time

FOOD IN WAR TIME. By GRAHAM LUSK PH D Sc D 46 pages. Cloth 50 cents net. Published February 1918

Camac's "Epoch-making Contributions"

EPOCH MAKING CONTRIBUTIONS IN MEDICINE AND SURGERY Collected and arranged by C V B CAMAC, M D, of New York City Octavo of 450 pages, illustrated. Artistically bound, \$4.00 net. Published January, 1909

"Dr Camac has provided us with a most interesting aggregation of classical essays. We hope that members of the profession will show the appreciation of his endeavors."—THERAPEUTIC GAZETTE.

Slade's Physical Examination and Diagnostic Anatomy

PHYSICAL EXAMINATION AND DIAGNOSTIC ANATOMY By CHARLES B. SLADE, M. D., formerly of University and Bellevue Medical School. 12mo of 250 pages, illustrated. Second Edition—published September, 1916. Cloth \$1.25 net.

Abbott's Medical Electricity

MEDICAL ELECTRICITY By GEORGE KNAPP ABBOTT, M. D., Dean and Professor of Physiological Therapy and Practice, College of Medical Evangelists, Loma Linda, California. 12mo of 132 pages, illustrated. Cloth, \$1.25 net. April, 1915.

Stevens' Practice of Medicine

New (10th) Edition

A MANUAL OF THE PRACTICE OF MEDICINE. By A. STEVENS, A. M., M. D., Professor of Pathology, Woman's Medical College, Phila. Specially intended for students preparing for graduation and hospital examinations. Post-octavo, 620 pages, illustrated. Cloth, \$1.75 net. Published July 1915.

Saunders' Pocket Formulary

New (9th) Edition

SAUNDERS' POCKET MEDICAL FORMULARY By WILLIAM M. L. WELLS, M. D., one of the best known authorities. With an Appendix on external Medication, Poisons and Fatal Doses. Numerical Table, very treatment of Asphyxia from night terrors, Febrile Fevers, etc. Lap \$1.25 net. January 1909.

Deaderick on Malaria

PRACTICAL STUDY OF MALARIA By WILLIAM H. DEADERICK, M. D., Member American Society of Tropical Medicine, Fellow London Society of Tropical Medicine and Hygiene. Octavo of 402 pages, illustrated. Cloth \$4.50 net. Half Morocco, \$6.00 net. Published November 1909.

Niles on Pellagra

Second Edition—January 1916

PELLAGRA By GEORGE M. NILES, M. D., Gastroenterologist to the Georgia Baptist Hospital, Atlanta. Octavo of 225 pages, illustrated. Cloth \$3.00 net.

Hinsdale's Hydrotherapy

HYDROTHERAPY By GUY HINSDALE, M. D., Fellow Royal Society of Medicine of Great Britain. Octavo of 466 pages, illustrated. Cloth \$3.50 net. August 1910.

Todd's Clinical Diagnosis

Fourth Edition—June 1913

CLINICAL DIAGNOSIS. A MANUAL OF LABORATORY METHODS. By JAMES CAMPBELL TODD, M. D., Professor of Pathology, University of Colorado. 12mo of 250 pages. Cloth \$1.00 net.

